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Common HUNTING TECHNICAL SERVICE

Common MALAYSIAN WEEDS and their CONTROL



BY
D. E. BARNES
M. M. CHANDAPILLAI

Ansar 529 is specially manufactured in Malaysia



for total eradication of weeds



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COMMON MALAYSIAN WEEDS AND THEIR CONTROL

by

D. E. BARNES
Ph. D. (Florida)

AND

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M. Sc. (Wales)

HUNTING TECHNICAL SERVICES
LIBRARY

Kuala Lumpur, Nov. 1972.

FOREWORD

Ansul (Malaysia) Sendirian Berhad is pleased to present this enlarged sequel to "Sixty Weeds of Malaysian Plantations" by the same authors. This handbook fulfils the hope expressed by the authors to be able to enlarge and improve on the previous one.

The recommended control methods represent those practices currently in use on many plantations in Malaysia.

The handbook illustrates 120 common plantation weed species comprising of 43 grasses, 15 sedges, 10 monocot broadleaves, 46 dicot broadleaves and 6 ferns. The grasses and sedges account for the greater number of species illustrated from any one single family. Therefore keys to the identification of the species of grasses and sedges only are given in the manual. Keys to the broadleaves and ferns will be provided when the manual is revised further to incorporate additional species. Again, thorough use has been made of published taxonomic literature by Henderson, Ridley, Bor, Holtum and the Rubber Research Institute of Malaysia.

It is hoped that the handbook will be found useful. Suggestions for corrections and on improvement to future editions will be most welcome.

Raby W. Padgett
Managing Director,
Ansul (M) Sdn. Berhad
Kuala Lumpur.
October 1972.

ACKNOWLEDGEMENT

The authors wish to acknowledge the services of the artist, who wants to remain anonymous, for the very beautiful drawings of the weed species made under instructions to details. Mr. Wong See Pin, Ansu (M) is thanked for making available the data on the control methods and spectrum of specific weeds.

The illustrations of weeds represent those practices currently in use in the region of Malaya.

The handbook illustrates 150 common plantation weed species comprising of 47 genera and 103 species. It includes botanical, as well as hand-drawn illustrations. The genera and species account for the greater number of species illustrated from any one single family. Therefore keys to the identification of the genera or species and values only are given in the manual. Keys to the genera and species will be provided when the manual is revised further to include additional species. Again, through use has been made of published taxonomic literature by Hantsch, Bitter, For. Holttum and the Kew Herbarium, Kew, London, England.

It is hoped that the handbook will be found useful. Suggestions for correction and an improvement in future editions will be most welcome.

Kaly W. Prabhu
Physiologist, Director
Ansu (M) Sdn. Bhd.
Kuala Lumpur
October 1972.

Botanical Name: *Axonopus compressus* (Sw.) P. Beauv.

Common Name: Carpet Grass

Malay Name: Rumput Parit

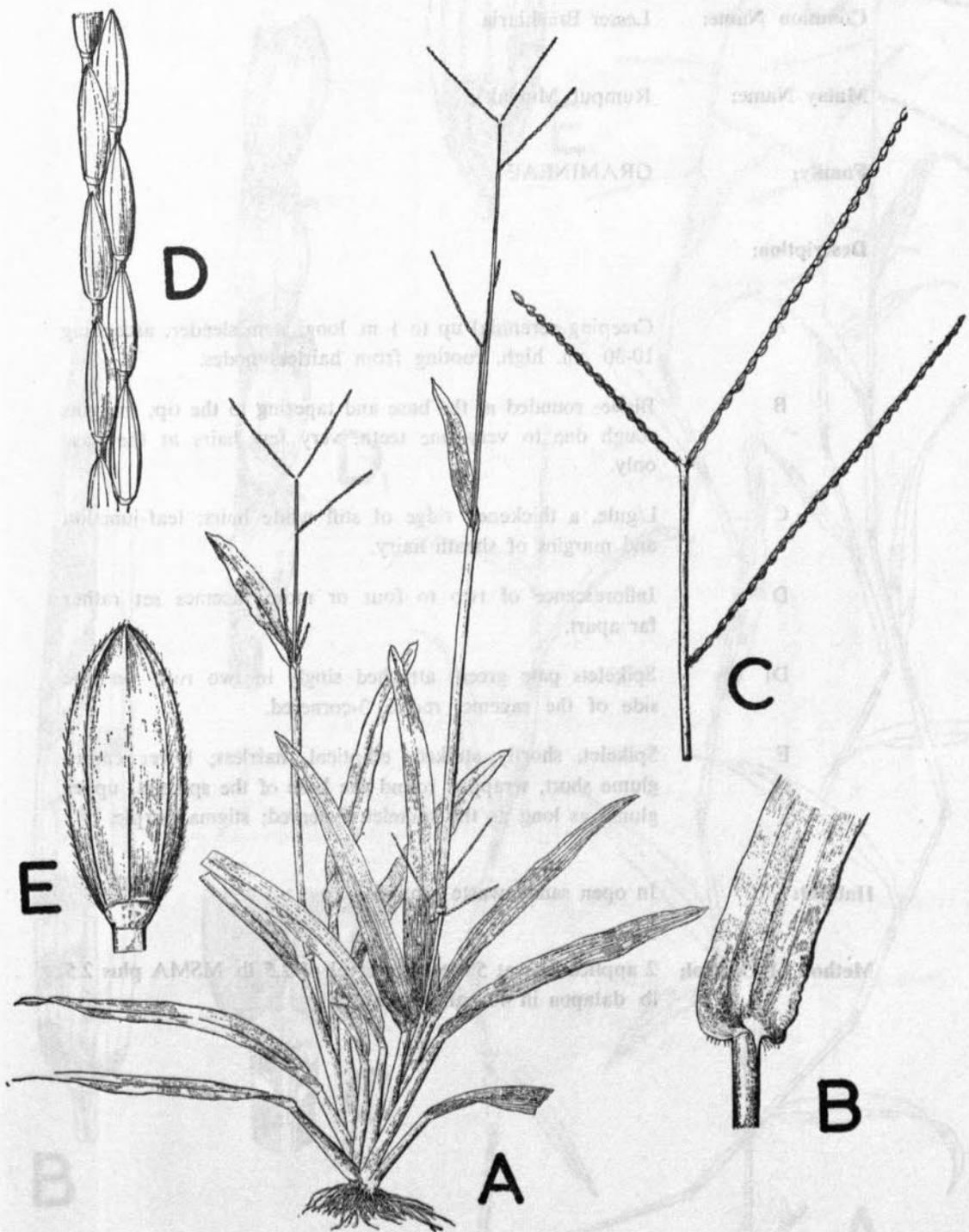
Family: GRAMINEAE

Description:

- A Stem, creeping by stolons producing leafy tufts 15-60 cm. high and rooting at the nodes which bear hairs up to 2 mm. long. Leaf blade often crinkled along the whole length, edges parallel for half the length of the blade, hairy all over.
- B Ligule fine membranous; pale chevrons at the base of the blade. Very fine short hairs on margins of the blade base.
- C Inflorescences of usually two 1-sided spikes 5-10 cm. long, sometime another one lower down.
- D Spikelets green, alternate on either side of the flattened rachis, not overlapping, pressed close to the narrow axis of the spike in 2 rows.
- E Single spikelet, elliptical, green or purple, each with a sterile lower floret and an upper bisexual one; lower empty glume absent; upper glume with distinct green veins.

Habitat: Very common by roadsides, in gardens, waste and cultivated lands.

Method of Control: 2.5 lb MSMA plus 8 lb sodium chlorate in 60 gallons water. Spot spray one month later where necessary.



Botanical Name: *Brachiaria milliformis* (Presl) A. Chase

Common Name: Lesser Brachiaria

Malay Name: Rumput Minyak

Family: GRAMINEAE

Description:

A Creeping perennial up to 1 m. long, stem slender, ascending 10-30 cm. high, rooting from hairless nodes.

B Blades rounded at the base and tapering to the tip; margins rough due to very fine teeth, very few hairs at the base only.

C Ligule, a thickened ridge of stiff white hairs; leaf-junction and margins of sheath hairy.

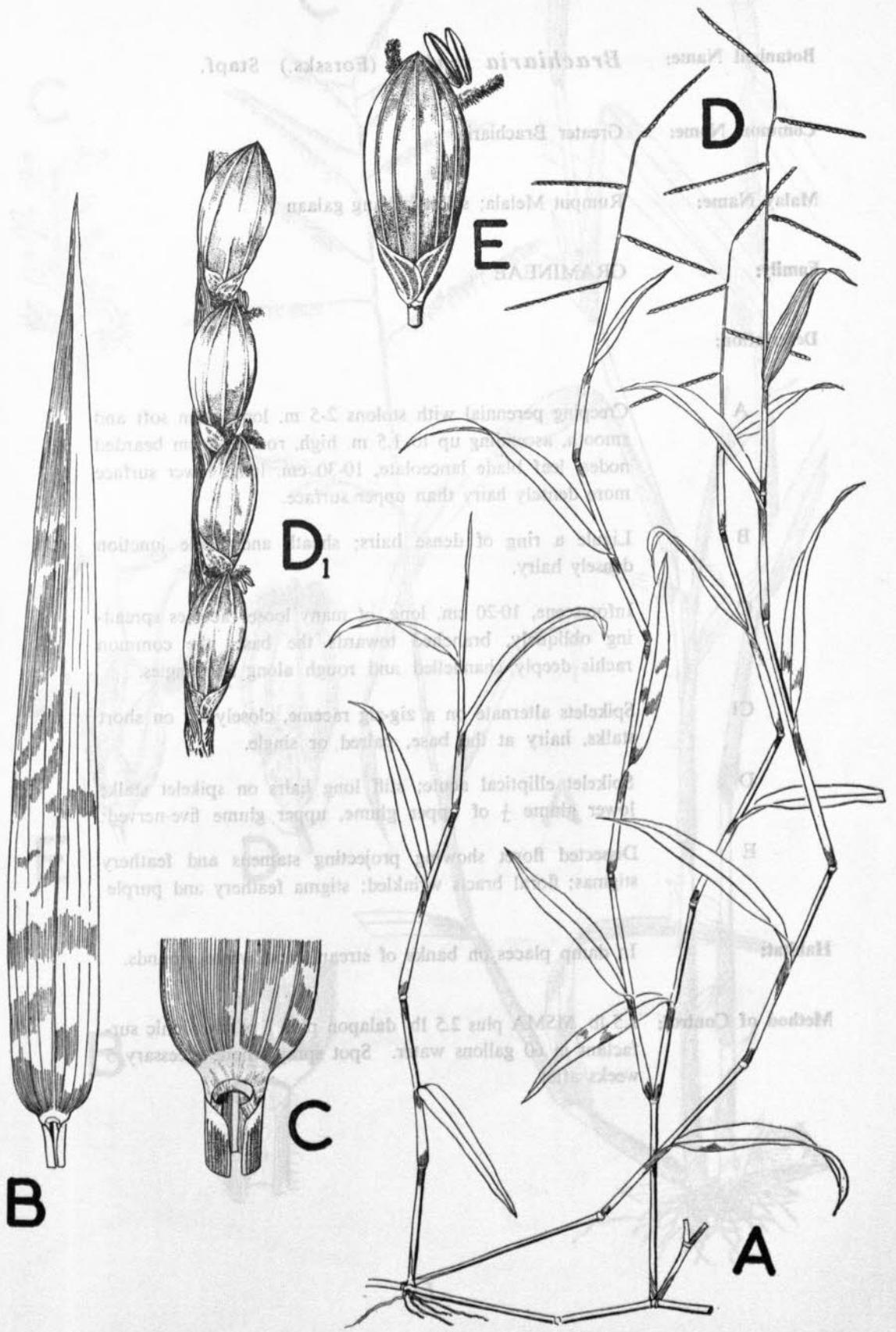
D Inflorescence of two to four or more racemes set rather far apart.

DI Spikelets pale green, attached singly in two rows on one side of the raceme, rachis 3-cornered.

E Spikelet, shortly stalked, elliptical, hairless; lower empty glume short, wrapped round the base of the spikelet; upper glume as long as the spikelet, 7-nerved; stigma purple.

Habitat: In open sandy waste grounds.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 2.5 lb dalapon in 40 gallons water.



Botanical Name: *Brachiaria mutica* (Forssks.) Stapf.

Common Name: Greater Brachiaria

Malay Name: Rumput Melala; suket babang galaan

Family: GRAMINEAE

Description:

A Creeping perennial with stolons 2-5 m. long, stem soft and smooth, ascending up to 1.5 m. high, rooting from bearded nodes; leaf blade lanceolate, 10-30 cm. long, lower surface more densely hairy than upper surface.

B Ligule a ring of dense hairs; sheath and blade junction densely hairy.

C Inflorescence, 10-20 cm. long, of many loose racemes spreading obliquely, branched towards the base, the common rachis deeply channelled and rough along the angles.

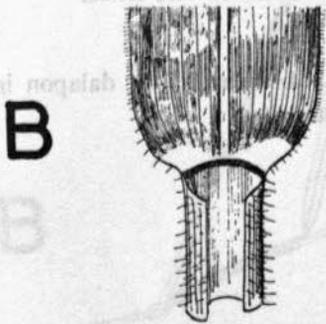
Cl Spikelets alternate on a zig-zig raceme, closely set on short stalks, hairy at the base, paired or single.

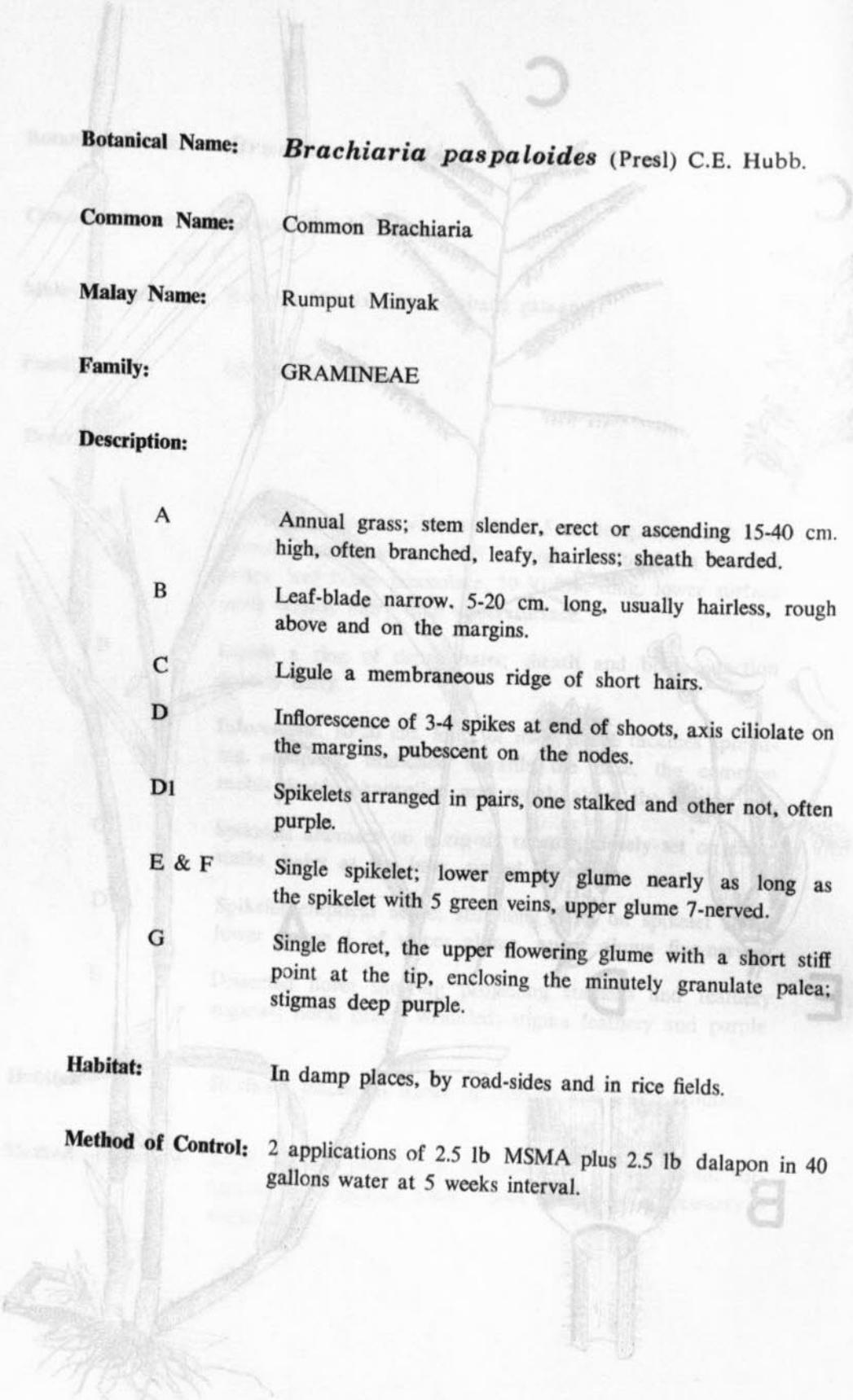
D Spikelet elliptical acute; stiff long hairs on spikelet stalk; lower glume $\frac{1}{3}$ of upper glume, upper glume five-nerved;

E Dissected floret showing projecting stamens and feathery stigmas; floral bracts wrinkled; stigma feathery and purple

Habitat: In damp places on banks of streams and waste grounds.

Method of Control: 2.5 lb MSMA plus 2.5 lb dalapon plus 1 pt non-ionic surfactant in 60 gallons water. Spot spray where necessary 5 weeks after.





Botanical Name: *Brachiaria paspaloides* (Presl) C.E. Hubb.

Common Name: Common Brachiaria

Malay Name: Rumput Minyak

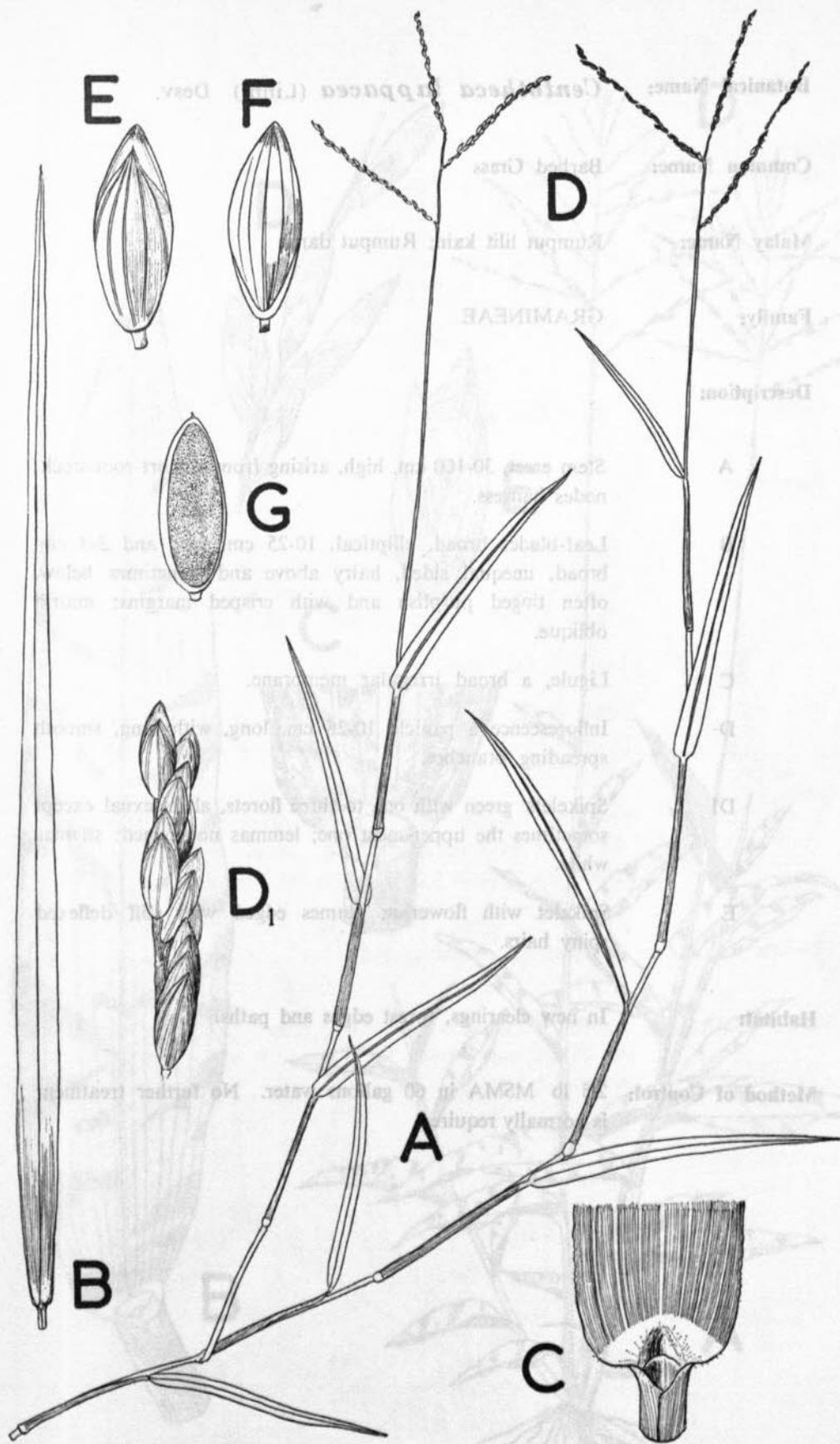
Family: GRAMINEAE

Description:

- A Annual grass; stem slender, erect or ascending 15-40 cm. high, often branched, leafy, hairless; sheath bearded.
- B Leaf-blade narrow, 5-20 cm. long, usually hairless, rough above and on the margins.
- C Ligule a membranous ridge of short hairs.
- D Inflorescence of 3-4 spikes at end of shoots, axis ciliolate on the margins, pubescent on the nodes.
- D1 Spikelets arranged in pairs, one stalked and other not, often purple.
- E & F Single spikelet; lower empty glume nearly as long as the spikelet with 5 green veins, upper glume 7-nerved.
- G Single floret, the upper flowering glume with a short stiff point at the tip, enclosing the minutely granulate palea; stigmas deep purple.

Habitat: In damp places, by road-sides and in rice fields.

Method of Control: 2 applications of 2.5 lb MSMA plus 2.5 lb dalapon in 40 gallons water at 5 weeks interval.



Botanical Name: *Centotheca lappacea* (Linn.) Desv.

Common Name: Barbed Grass

Malay Name: Rumput lilit kain; Rumput darah

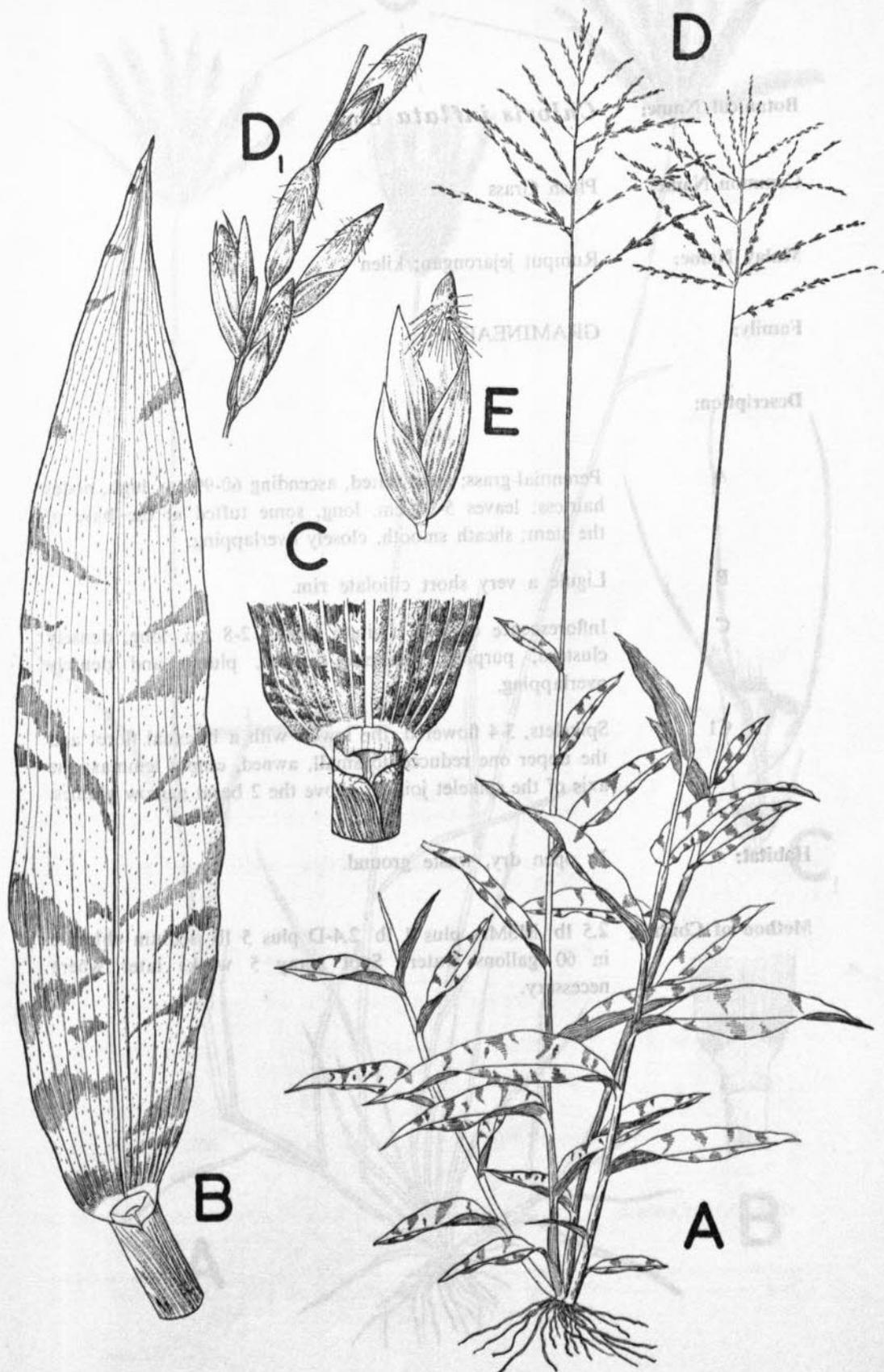
Family: GRAMINEAE

Description:

- A Stem erect, 30-100 cm. high, arising from a short root-stock; nodes hairless.
- B Leaf-blades broad, elliptical, 10-25 cm. long and 2-3 cm. broad, unequal sided, hairy above and sometimes below, often tinged purplish and with crisped margins; midrib oblique.
- C Ligule, a broad irregular membrane.
- D Inflorescence a panicle 10-25 cm. long, with long, smooth spreading branches.
- D1 Spikelets green with one to three florets, all bisexual except sometimes the upper-most one; lemmas not awned; stigmas white.
- E Spikelet with flowering glumes edged with stiff deflexed spiny hairs.

Habitat: In new clearings, forest edges and paths.

Method of Control: 2.5 lb MSMA in 60 gallons water. No further treatment is normally required.



Botanical Name: *Chloris inflata* Link.

Common Name: Plush Grass

Malay Name: Rumput jejarongan; kilen

Family: GRAMINEAE

Description:

A Perennial grass; stem tufted, ascending 60-90 cm. high, nodes hairless; leaves 5-30 cm. long, some tufted at the base of the stem; sheath smooth, closely overlapping.

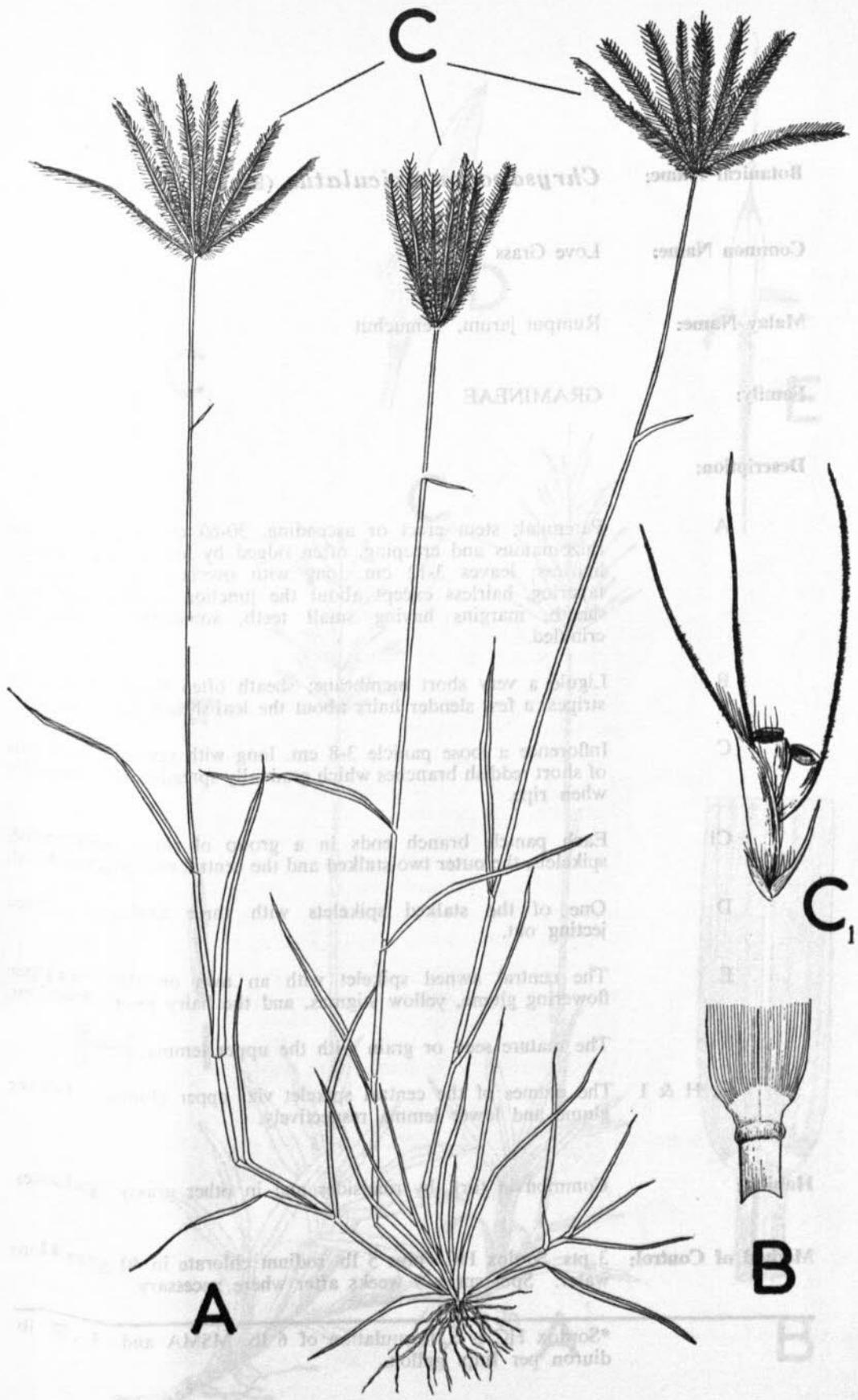
B Ligule a very short ciliolate rim.

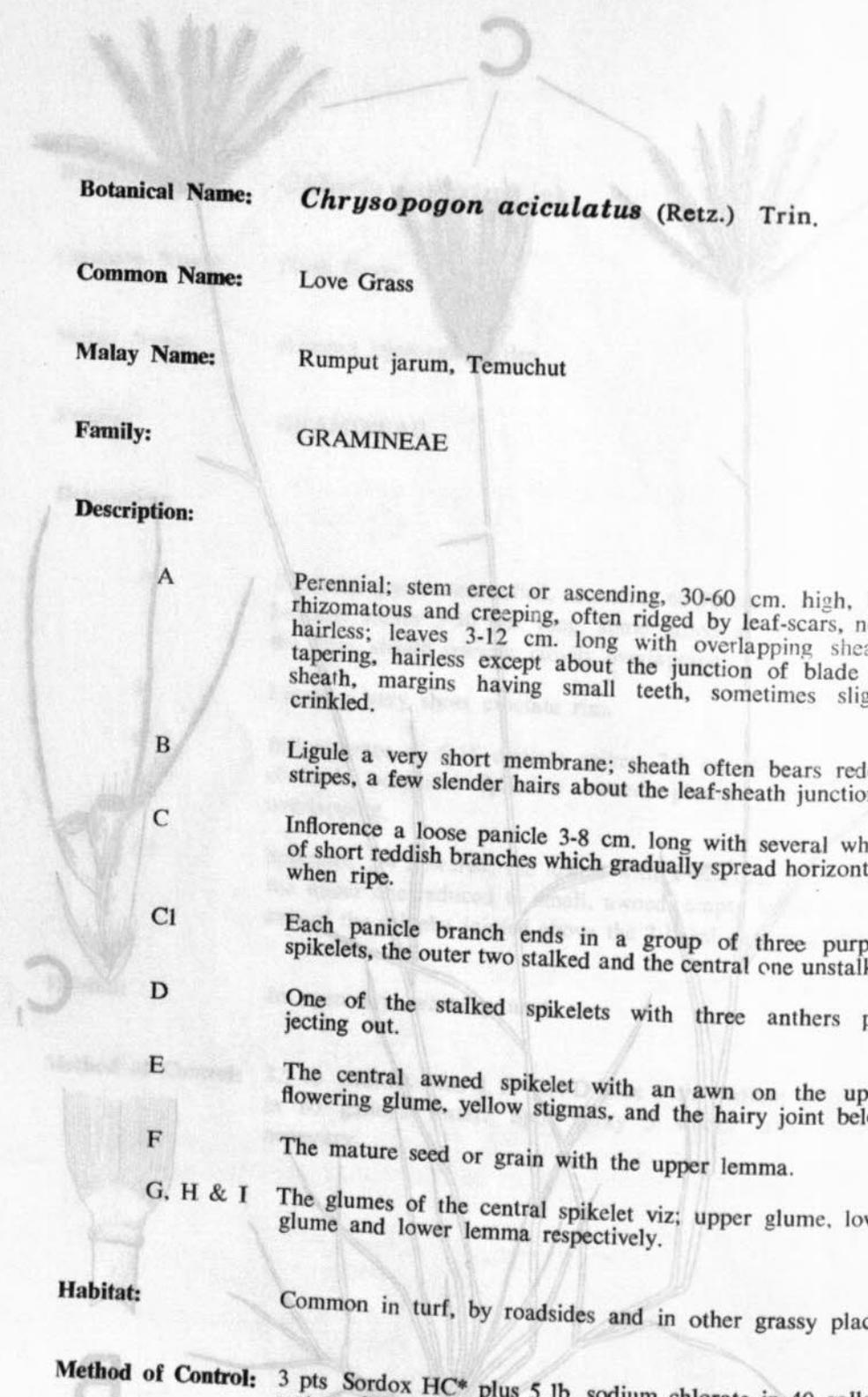
C Inflorescence of 5-15 digitate spikes, 2-8 cm. long, densely clustered, purplish. Spikelets awned, plump and densely overlapping.

C1 Spikelets, 3-4 flowered, the lowest with a bisexual floret and the upper one reduced to small, awned, empty lemmas; the axis of the spikelet jointed above the 2 basal narrow glumes.

Habitat: In open dry, waste ground.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 60 gallons water. Spot spray 5 weeks later where necessary.





Botanical Name: *Chrysopogon aciculatus* (Retz.) Trin.

Common Name: Love Grass

Malay Name: Rumput jarum, Temuchut

Family: GRAMINEAE

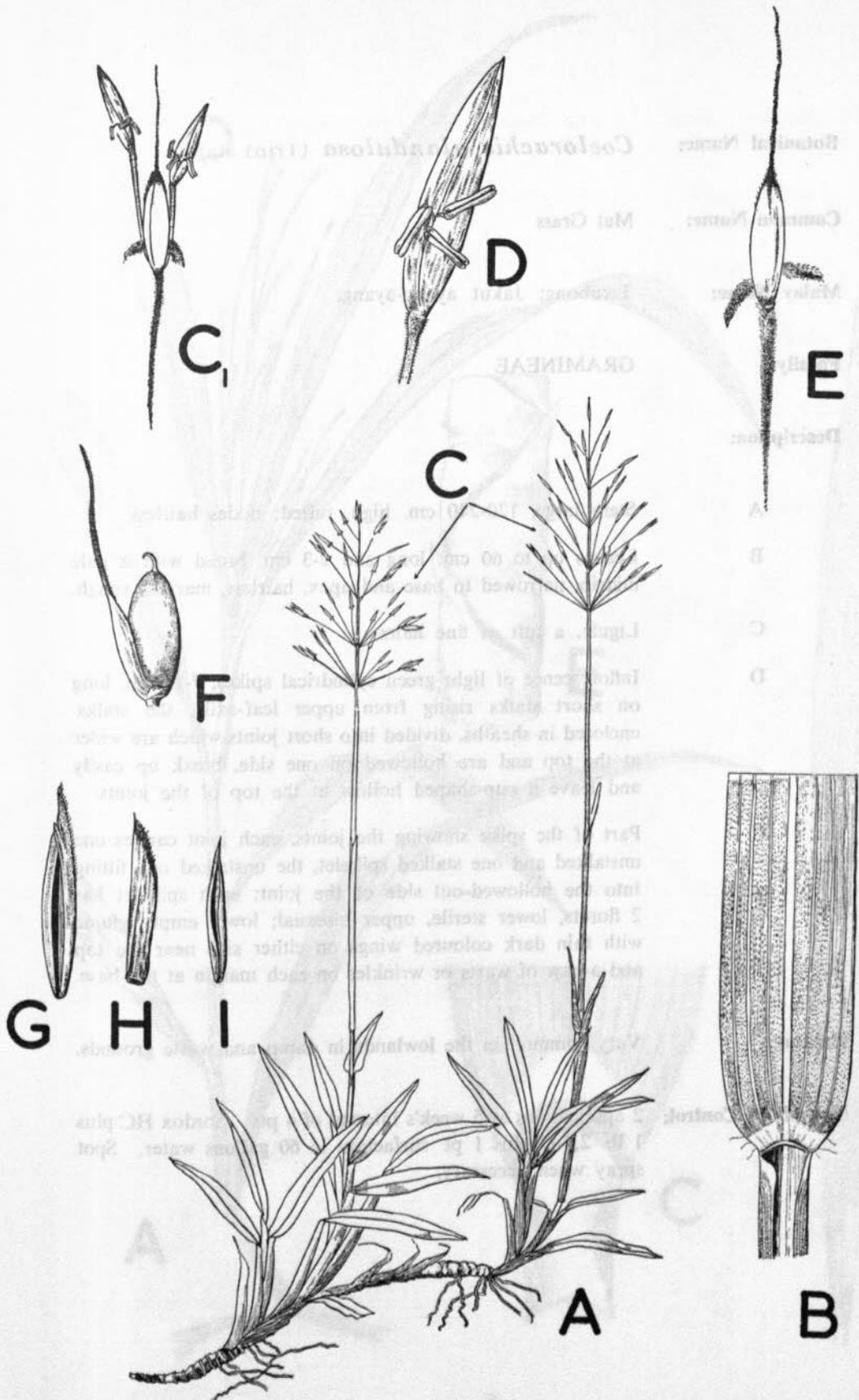
Description:

- A Perennial; stem erect or ascending, 30-60 cm. high, base rhizomatous and creeping, often ridged by leaf-scars, nodes hairless; leaves 3-12 cm. long with overlapping sheaths, tapering, hairless except about the junction of blade and sheath, margins having small teeth, sometimes slightly crinkled.
- B Ligule a very short membrane; sheath often bears reddish stripes, a few slender hairs about the leaf-sheath junction.
- C Inflorescence a loose panicle 3-8 cm. long with several whorls of short reddish branches which gradually spread horizontally when ripe.
- Cl Each panicle branch ends in a group of three purplish spikelets, the outer two stalked and the central one unstalked.
- D One of the stalked spikelets with three anthers projecting out.
- E The central awned spikelet with an awn on the upper flowering glume, yellow stigmas, and the hairy joint below.
- F The mature seed or grain with the upper lemma.
- G, H & I The glumes of the central spikelet viz; upper glume, lower glume and lower lemma respectively.

Habitat: Common in turf, by roadsides and in other grassy places.

Method of Control: 3 pts Sordox HC* plus 5 lb sodium chlorate in 40 gallons water. Spot spray 5 weeks after where necessary.

*Sordox HC is a formulation of 6 lb. MSMA and 1.2 lb. diuron per Imp. gallon.



Botanical Name: *Coelorachis glandulosa* (Trin) stapf.

Common Name: Mat Grass

Malay Name: Terubong; Jakut ayang-ayang.

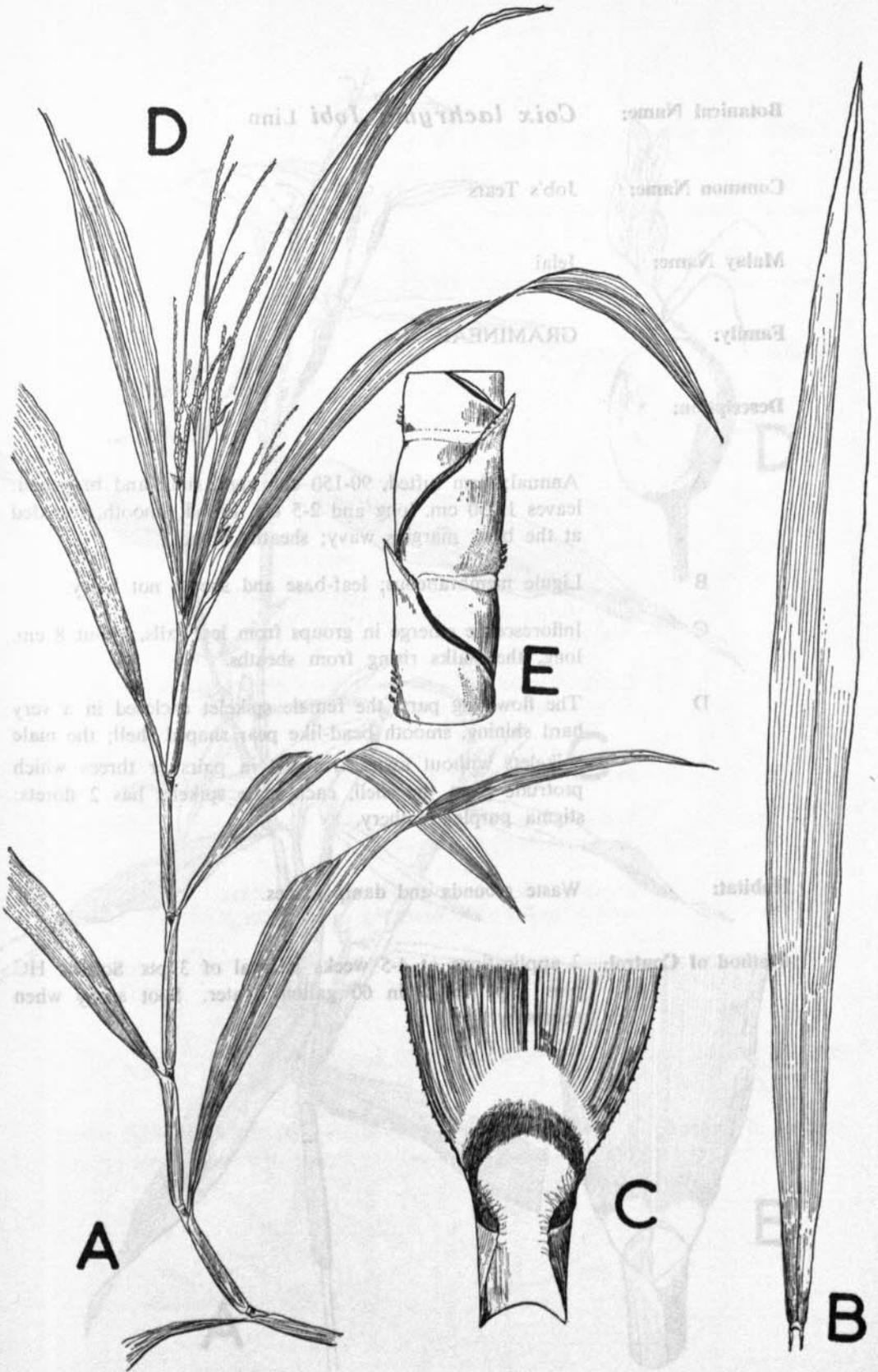
Family: GRAMINEAE

Description:

- A Stem large, 120-240 cm. high, tufted; nodes hairless.
- B Leaves up to 60 cm. long and 2-3 cm. broad with a pale midrib, narrowed to base and apex, hairless, margins rough.
- C Ligule, a tuft of fine hairs.
- D Inflorescence of light green cylindrical spikes, 7-15 cm. long on short stalks rising from upper leaf-axils; the stalks enclosed in sheaths, divided into short joints which are wider at the top and are hollowed on one side, break up easily and leave a cup-shaped hollow at the top of the joints.
- E Part of the spike showing the joints, each joint carries one unstalked and one stalked spikelet, the unstalked one fitting into the hollowed-out side of the joint; each spikelet has 2 florets, lower sterile, upper bisexual; lower empty glume with thin dark coloured wings on either side near the top and a row of warts or wrinkles on each margin at the base.

Habitat: Very common in the lowlands in damp and waste grounds.

Method of Control: 2 applications at 5 week's interval of 4 pts Sordox HC plus 1 lb 2,4-D plus 1 pt surfactant in 60 gallons water. Spot spray when necessary.



Botanical Name: *Coix lachryma Jobi* Linn.

Common Name: Job's Tears

Malay Name: Jelai

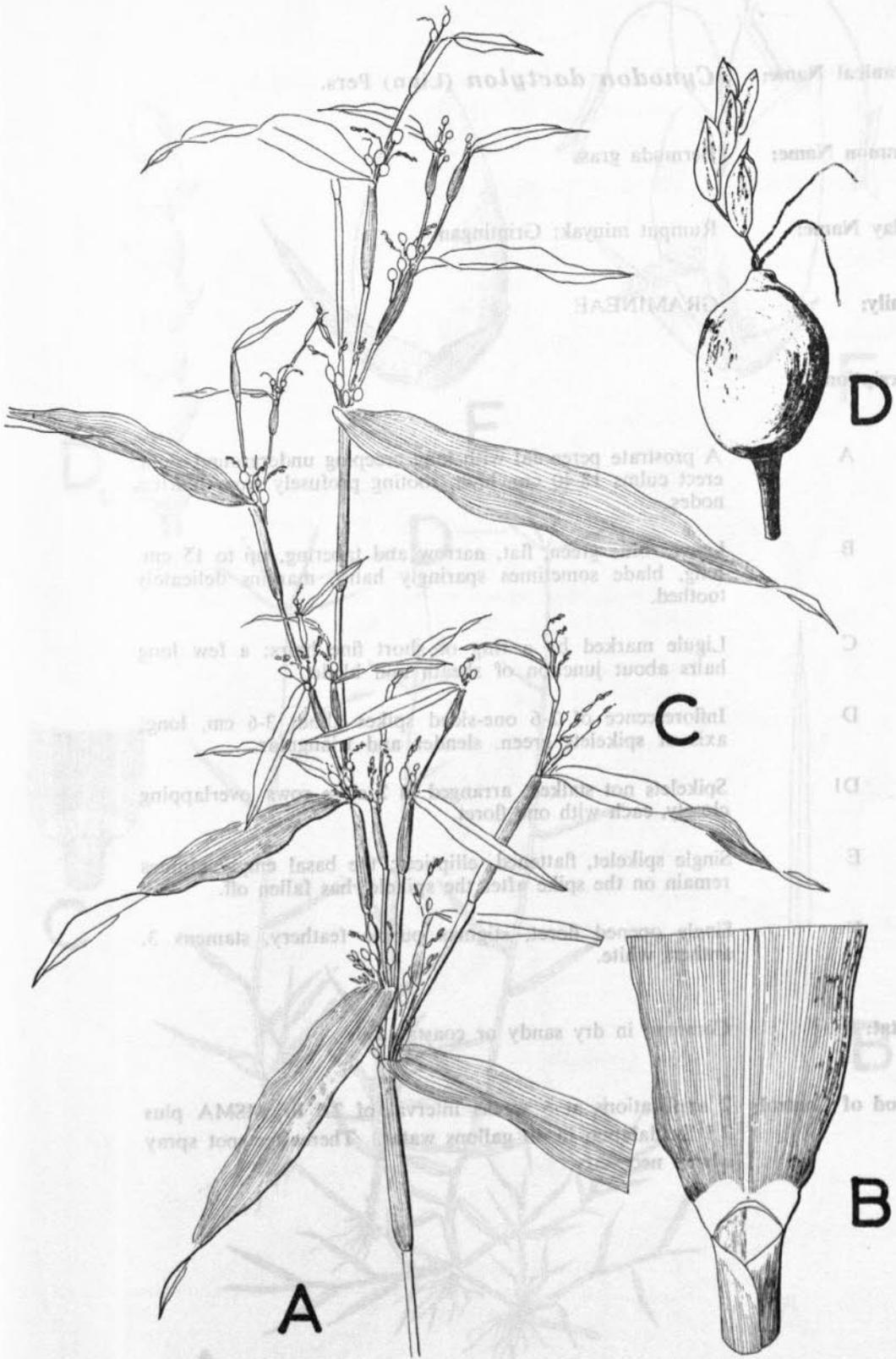
Family: GRAMINEAE

Description:

- A Annual; stem tufted, 90-150 cm. high, stout and branched; leaves 15-50 cm. long and 2-5 cm. broad, smooth, rounded at the base, margins wavy; sheaths broad.
- B Ligule membranous; leaf-base and sheath not hairy.
- C Inflorescence emerge in groups from leaf-axils, about 8 cm. long, the stalks rising from sheaths.
- D The flowering part; the female spikelet enclosed in a very hard shining, smooth bead-like pear shaped shell; the male spikelets without awns arranged in pairs or threes which protrude from the shell, each male spikelet has 2 florets; stigma purple, feathery.

Habitat: Waste grounds and damp places.

Method of Control: 2 applications at 4-5 weeks interval of 3 pts Sordox HC plus 1 pt 2,4-D in 60 gallons water. Spot spray when necessary.



Botanical Name: *Cynodon dactylon* (Linn) Pers.

Common Name: Bermuda grass

Malay Name: Rumput minyak; Grintingan

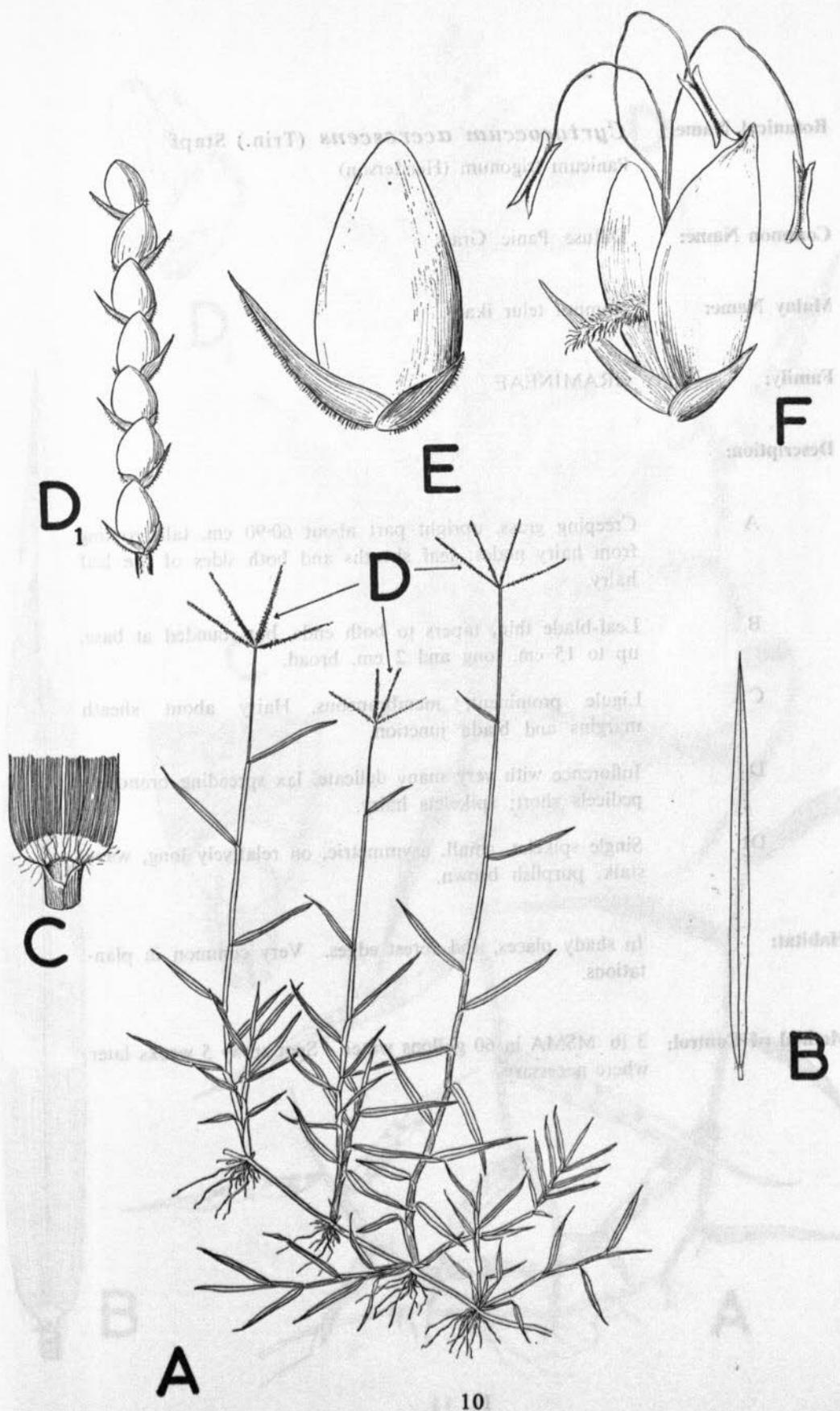
Family: GRAMINEAE

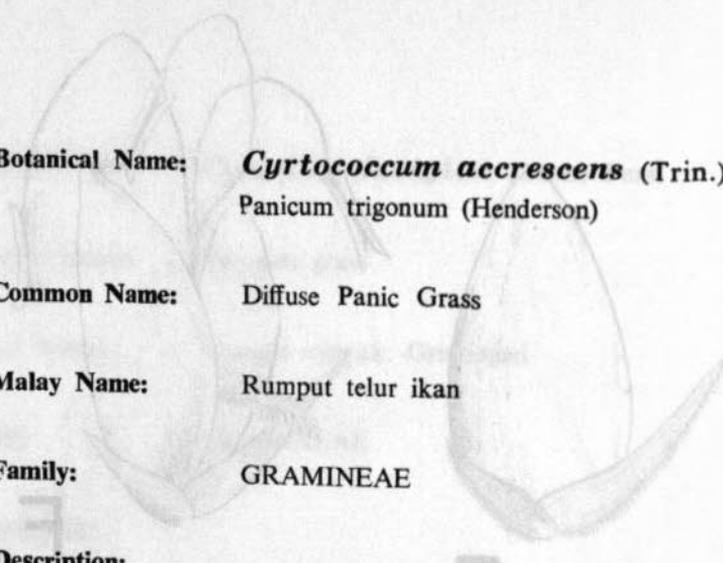
Description:

- A A prostrate perennial with long creeping underground stem, erect culms 18-40 cm. high, rooting profusely from hairless nodes.
- B Leaves blue green, flat, narrow and tapering, up to 15 cm. long, blade sometimes sparingly hairy, margins delicately toothed.
- C Ligule marked by a ring of short fine hairs; a few long hairs about junction of sheath and blade.
- D Inflorescence of 2-6 one-sided spikes about 3-6 cm. long; axis of spikelets green, slender and triangular.
- D1 Spikelets not stalked, arranged in 2 close rows overlapping closely, each with one floret.
- E Single spikelet, flattened, elliptical; the basal empty glumes remain on the spike after the spikelet has fallen off.
- F Single opened floret, stigmas purple feathery, stamens 3, anthers white.

Habitat: Common in dry sandy or coastal soils.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 2.5 lb dalapon in 40 gallons water. Thereafter spot spray where necessary.





Botanical Name: *Cyrtococcum accrescens* (Trin.) Stapf
Panicum trigonum (Henderson)

Common Name: Diffuse Panic Grass

Malay Name: Rumput telur ikan

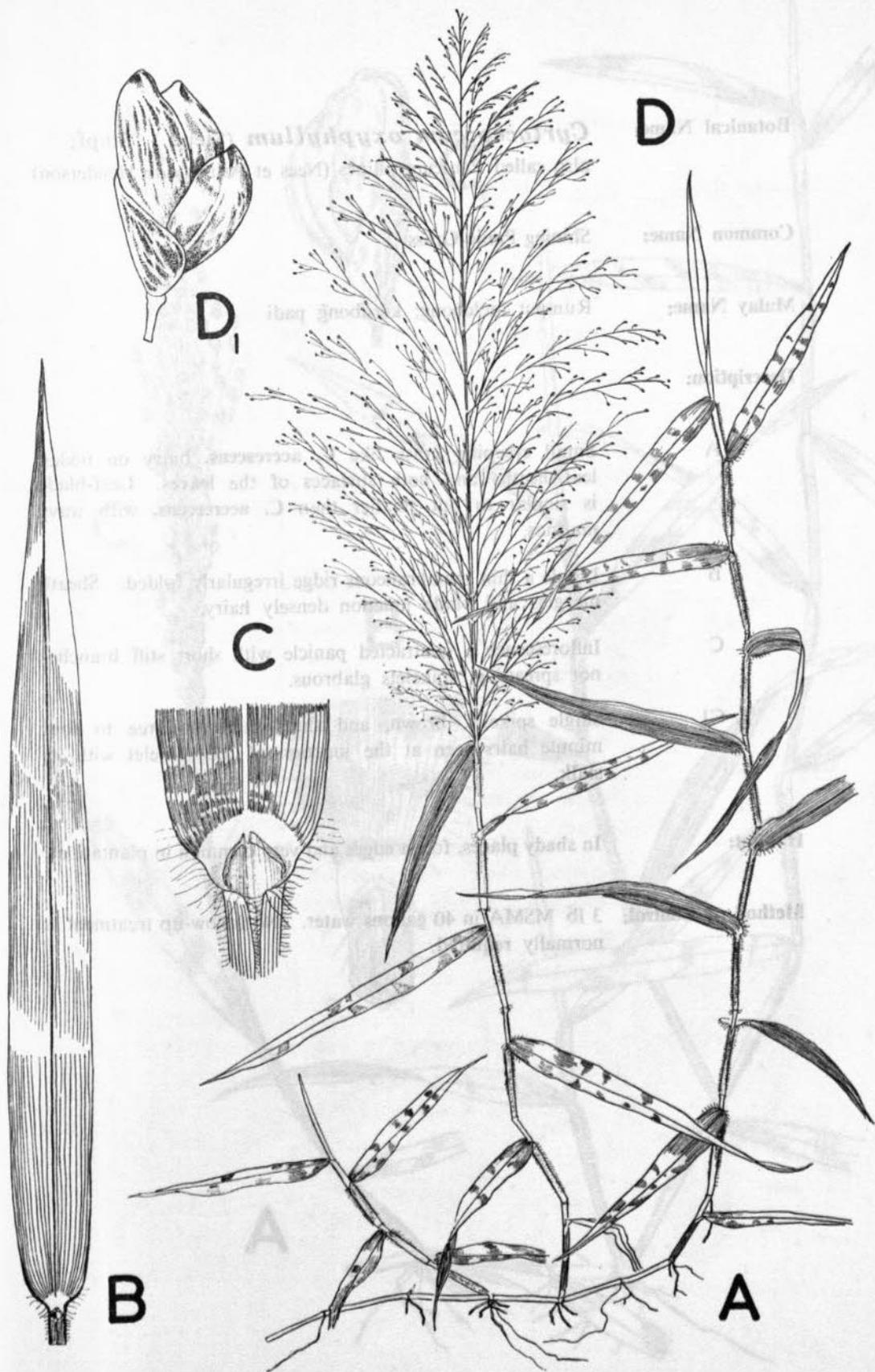
Family: GRAMINEAE

Description:

- A Creeping grass, upright part about 60-90 cm. tall, rooting from hairy nodes; leaf sheaths and both sides of the leaf hairy.
- B Leaf-blade thin, tapers to both ends, but rounded at base, up to 15 cm. long and 2 cm. broad.
- C Ligule prominent, membraneous. Hairy about sheath margins and blade junction.
- D Inflorescence with very many delicate, lax spreading branches; pedicels short; spikelets hairy.
- D1 Single spikelet, small, asymmetric, on relatively long, wavy stalk, purplish brown.

Habitat: In shady places, and forest edges. Very common in plantations.

Method of Control: 3 lb MSMA in 60 gallons water. Spot spray 5 weeks later where necessary.



Botanical Name: *Cyrtococcum oxyphyllum* (Steud.) Stapf;
also called *Panicum pilipes* (Nees et Arn.) (vide Henderson)

Common Name: Shining Panic Grass

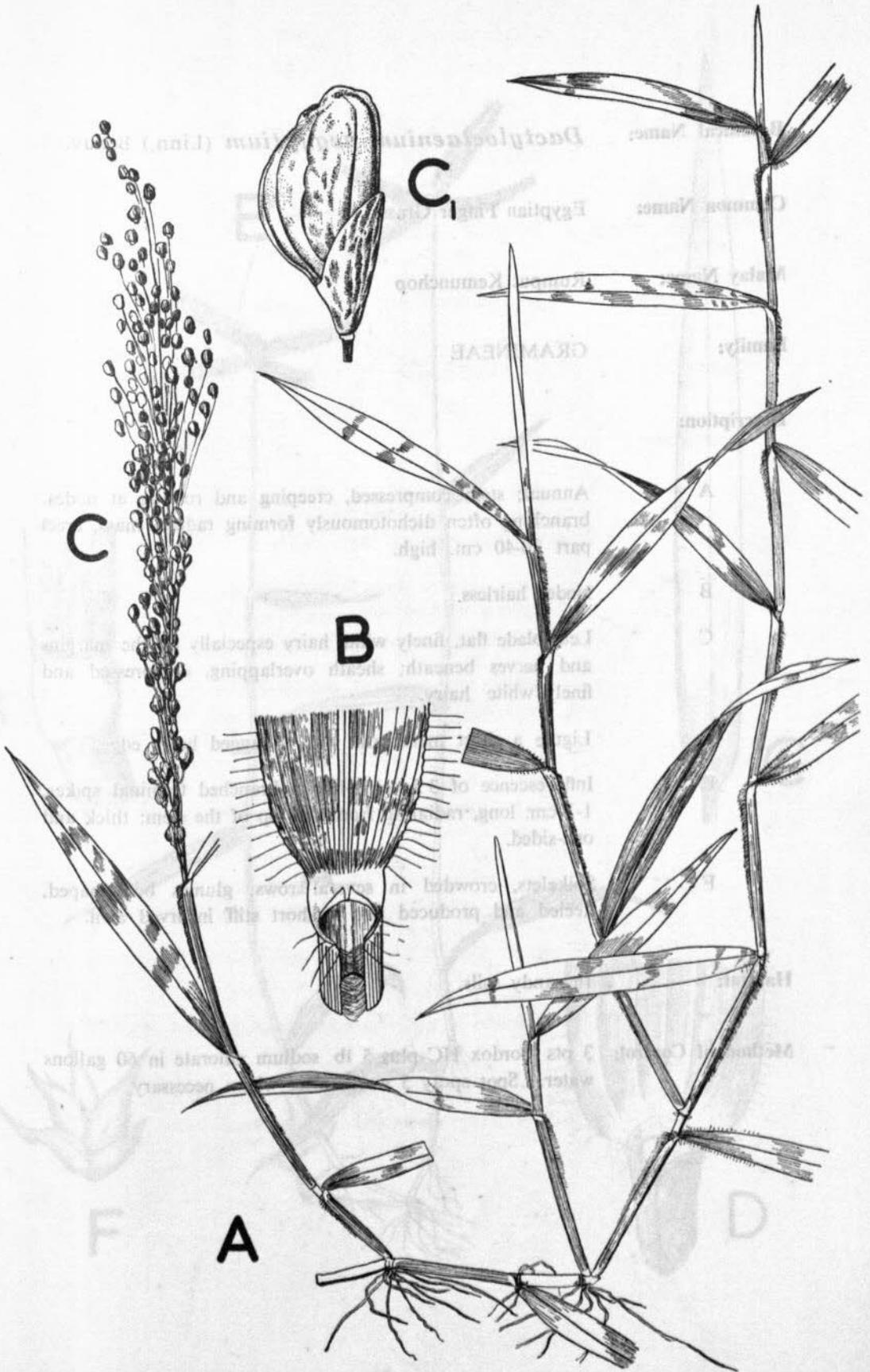
Malay Name: Rumput metebong; kerubong padi

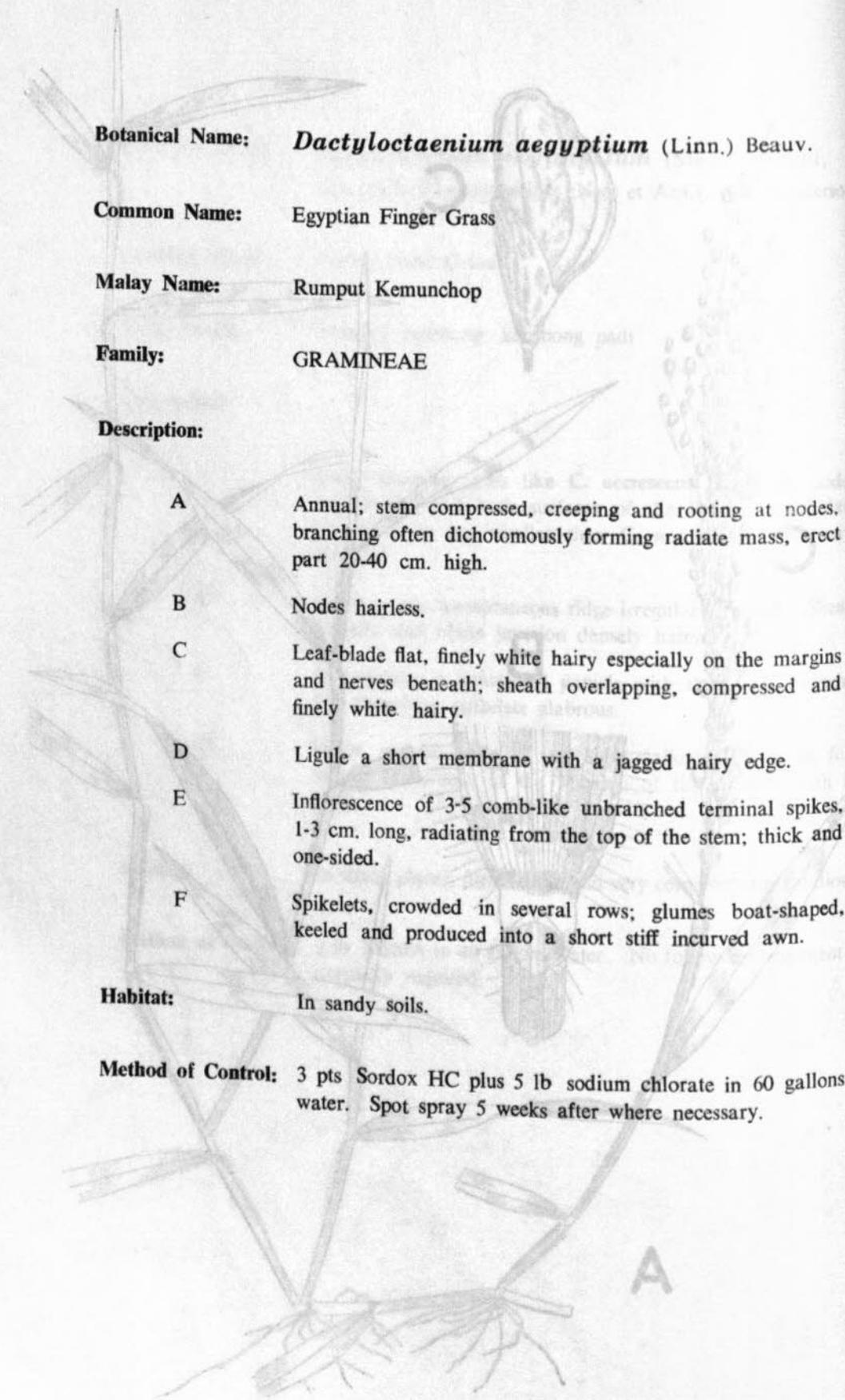
Description:

- A Small creeping grass like *C. accrescens*, hairy on nodes, leaf-sheaths and both surfaces of the leaves. Leaf-blade is similar to but smaller than *C. accrescens*, with wavy margins.
- B Ligule a thin membranous ridge irregularly folded. Sheath margins and blade junction densely hairy.
- C Inflorescence a contracted panicle with short stiff branches not spreading, spikelets glabrous.
- Cl Single spikelet, brown, and short-stalked. Three to four minute hairs seen at the junction of the spikelet with its stalk.

Habitat: In shady places, forest edges and very common in plantations.

Method of Control: 3 lb MSMA in 40 gallons water. No follow-up treatment is normally required.





Botanical Name: *Dactyloctenium aegyptium* (Linn.) Beauv.

Common Name: Egyptian Finger Grass

Malay Name: Rumput Kemunchop

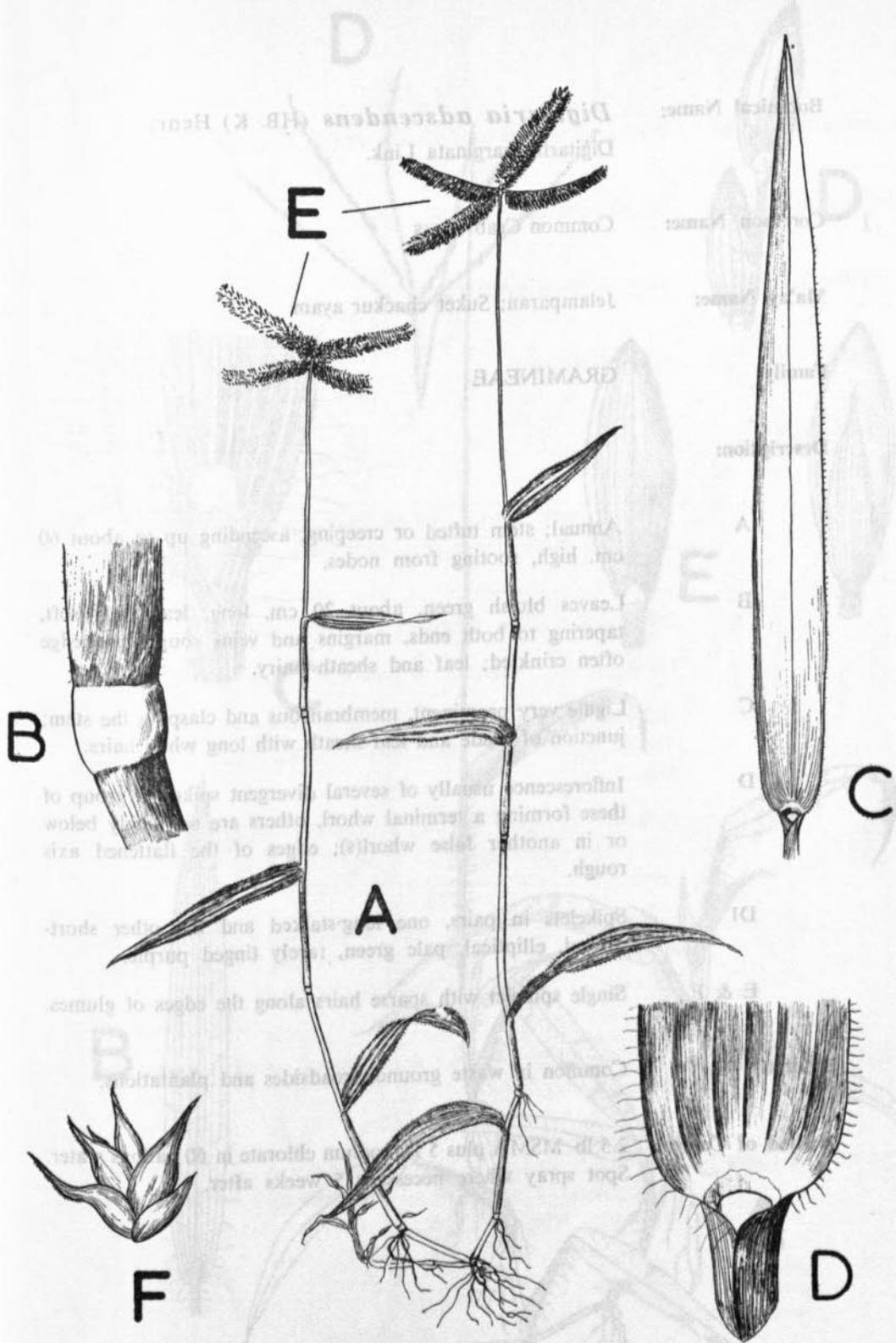
Family: GRAMINEAE

Description:

- A Annual; stem compressed, creeping and rooting at nodes, branching often dichotomously forming radiate mass, erect part 20-40 cm. high.
- B Nodes hairless.
- C Leaf-blade flat, finely white hairy especially on the margins and nerves beneath; sheath overlapping, compressed and finely white hairy.
- D Ligule a short membrane with a jagged hairy edge.
- E Inflorescence of 3-5 comb-like unbranched terminal spikes, 1-3 cm. long, radiating from the top of the stem; thick and one-sided.
- F Spikelets, crowded in several rows; glumes boat-shaped, keeled and produced into a short stiff incurved awn.

Habitat: In sandy soils.

Method of Control: 3 pts Sordox HC plus 5 lb sodium chlorate in 60 gallons water. Spot spray 5 weeks after where necessary.



Botanical Name: *Digitaria adscendens* (HB. K) Henr.
Digitaria marginata Link.

Common Name: Common Crab Grass

Ma'ay Name: Jelamparan; Suket chackur ayam

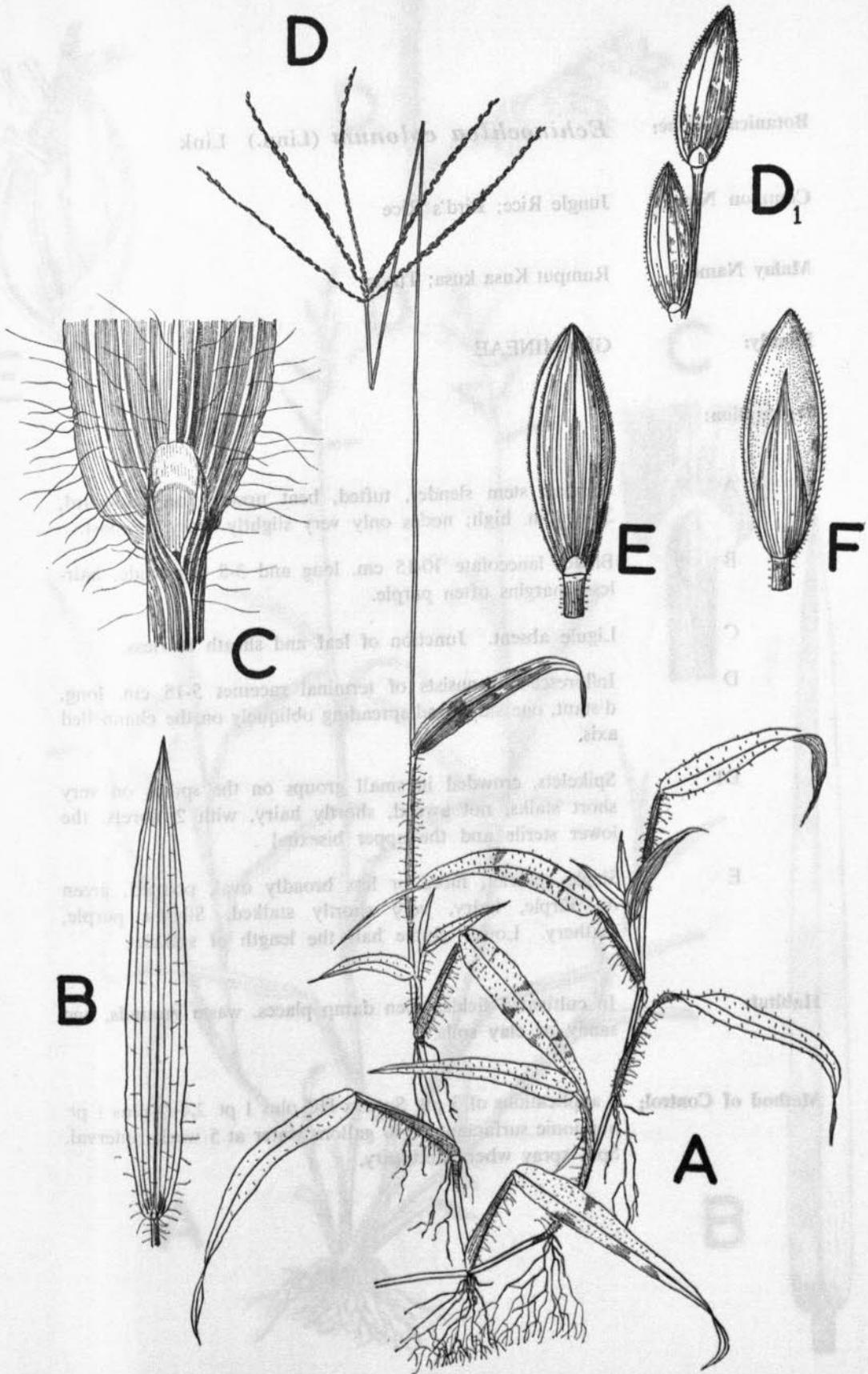
Family: GRAMINEAE

Description:

- A Annual; stem tufted or creeping, ascending up to about 60 cm. high, rooting from nodes.
- B Leaves bluish green, about 20 cm. long, leaf-blade soft, tapering to both ends, margins and veins rough, one edge often crinkled; leaf and sheath hairy.
- C Ligule very prominent, membraneous and clasping the stem; junction of blade and leaf-sheath with long white hairs.
- D Inflorescence usually of several divergent spikes, a group of these forming a terminal whorl, others are set singly below or in another false whorl(s); edges of the flattened axis rough.
- D1 Spikelets in pairs, one long-stalked and the other short-stalked, elliptical, pale green, rarely tinged purple.
- E & F Single spikelet with sparse hairs along the edges of glumes.

Habitat: Common in waste grounds, roadsides and plantations.

Method of Control: 2.5 lb MSMA plus 5 lb sodium chlorate in 60 gallons water. Spot spray where necessary 5 weeks after.



Botanical Name: *Echinochloa colonum* (Linn.) Link

Common Name: Jungle Rice; Bird's Rice

Malay Name: Rumput Kusa kusa; Tuton

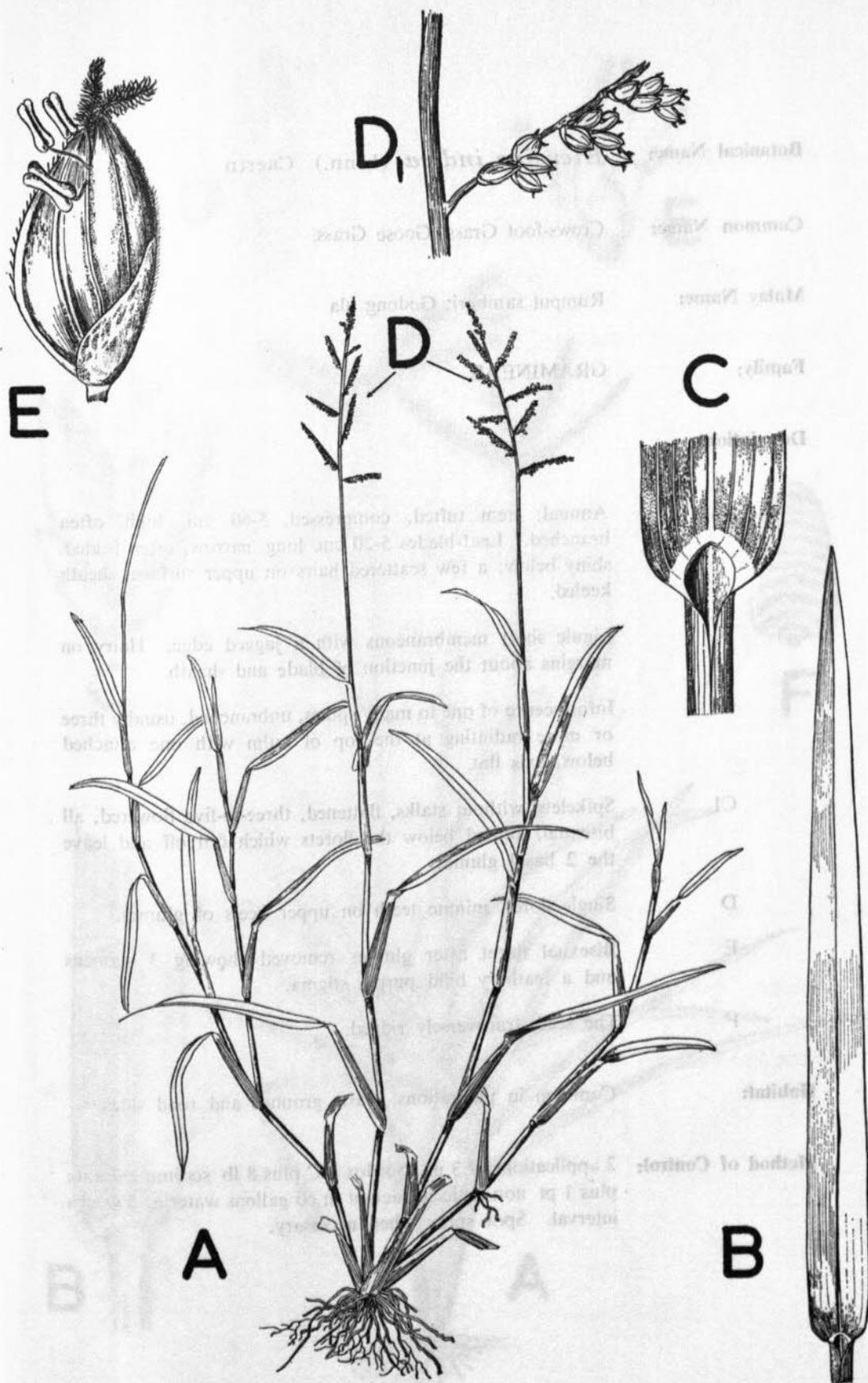
Family: GRAMINEAE

Description:

- A Annual; stem slender, tufted, bent upward and outward, 30-60 cm. high; nodes only very slightly hairy at most.
- B Blades lanceolate 10-15 cm. long and 3-8 mm wide, hairless, margins often purple.
- C Ligule absent. Junction of leaf and sheath hairless.
- D Inflorescence consists of terminal racemes 5-15 cm. long, distant, one sided and spreading obliquely on the channelled axis.
- D1 Spikelets, crowded in small groups on the spikes on very short stalks, not awned, shortly hairy, with 2 florets, the lower sterile and the upper bisexual.
- E Single spikelet, more or less broadly oval, pointed, green or purple, hairy, very shortly stalked. Stigma purple, feathery. Lower glume half the length of spikelet.

Habitat: In cultivated fields, open damp places, waste grounds, and sandy or clay soils.

Method of Control: 2 applications of 3 pts Sordox HC plus 1 pt 2,4-D plus 1 pt non-ionic surfactant in 40 gallons water at 5 weeks interval. Spot spray where necessary.



Botanical Name: *Eleusine indica* (Linn.) Gaertn

Common Name: Crows-foot Grass, Goose Grass.

Malay Name: Rumput sambari; Godong ula

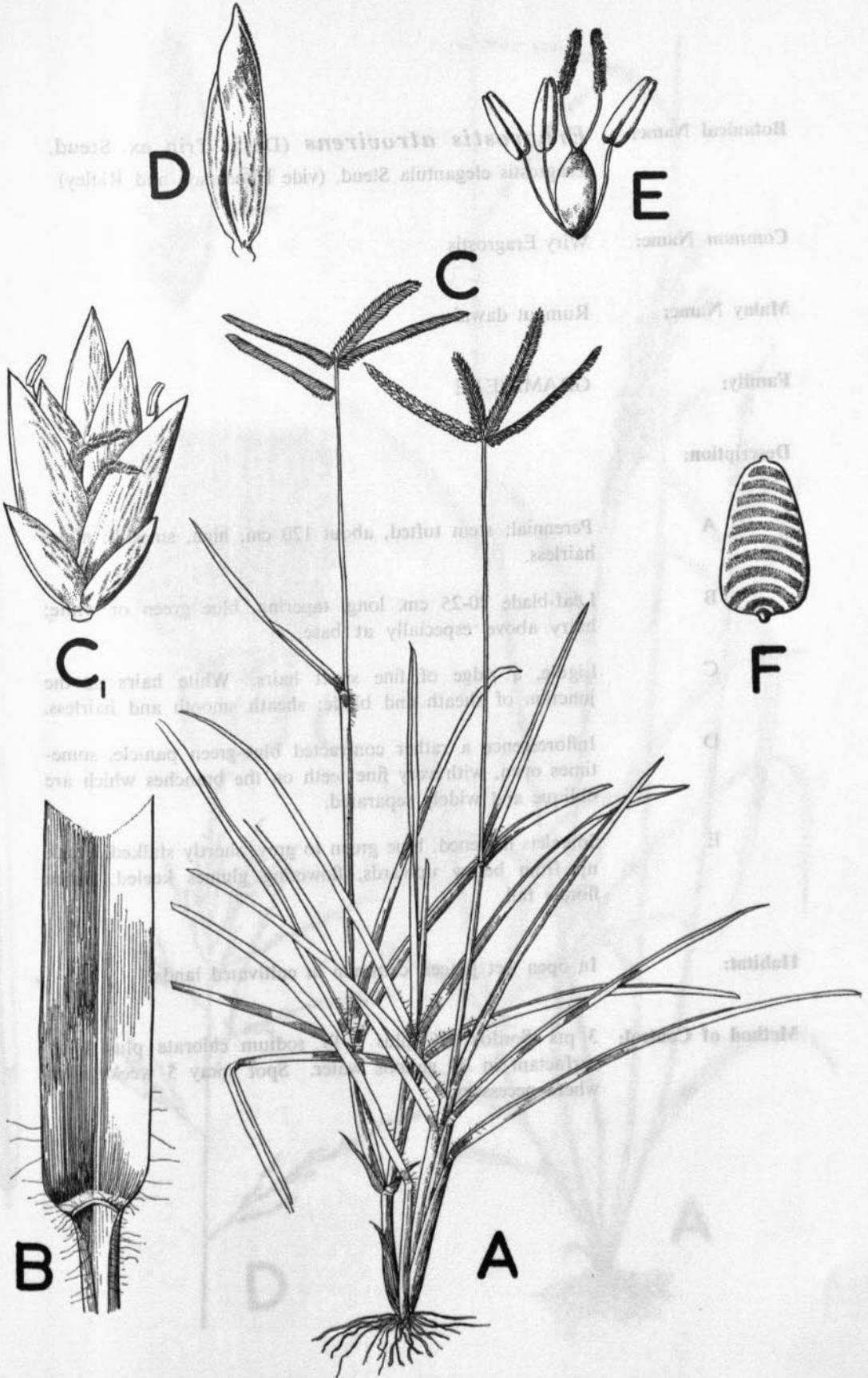
Family: GRAMINEAE

Description:

- A Annual; stem tufted, compressed, 5-60 cm. high, often branched. Leaf-blades 5-20 cm. long, narrow, often folded, shiny below; a few scattered hairs on upper surface, sheath keeled.
- B. Ligule short membranous with a jagged edge. Hairy on margins about the junction of blade and sheath.
- C Inflorescence of one to many spikes, unbranched, usually three or more radiating at the top of culm with one attached below, axis flat.
- C1 Spikelets, without stalks, flattened, three-to-five flowered, all bisexual, jointed below the florets which fall off and leave the 2 basal glumes.
- D Single floret, minute teeth on upper keels of glumes.
- E Bisexual floret after glumes removed showing 3 stamens and a feathery bifid purple stigma.
- F The seed, transversely ridged.

Habitat: Common in plantations, waste grounds and road sides.

Method of Control: 2 applications of 3 pts. Sordox HC plus 8 lb sodium chlorat plus 1 pt non-ionic surfactant in 60 gallons water at 5 weeks interval. Spot spray when necessary.



Botanical Name: *Eragrostis atrovirens* (Desf.) Trin. ex. Steud.
Eragrostis elegantula Steud. (vide Henderson and Ridley)

Common Name: Wiry Eragrostis

Malay Name: Rumput dawai

Family: GRAMINEAE

Description:

A Perennial; stem tufted, about 120 cm. high, smooth; nodes hairless.

B Leaf-blade 20-25 cm. long, tapering, blue green or white; hairy above especially at base.

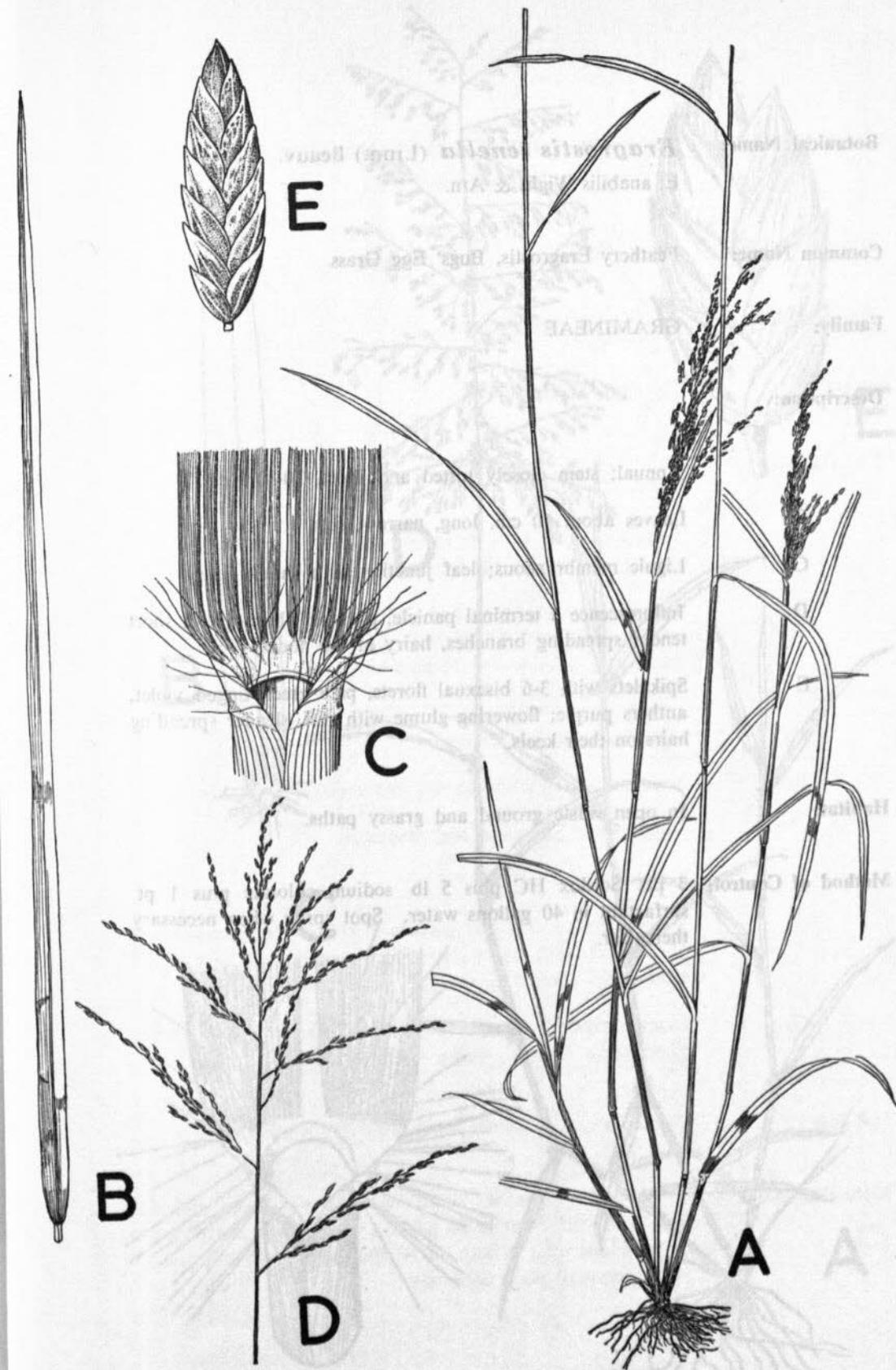
C Ligule, a ridge of fine short hairs. White hairs at the junction of sheath and blade; sheath smooth and hairless.

D Inflorescence a rather contracted blue-green panicle, sometimes open, with very fine teeth on the branches which are oblique and widely separated.

E Spikelets flattened, blue green to grey, shortly stalked, break up from below upwards, flowering glumes keeled, entire florets fall.

Habitat: In open wet places, common in cultivated lands.

Method of Control: 3 pts Sordox HC plus 5 lb sodium chlorate plus 1 pt surfactant in 40 gallons water. Spot spray 5 weeks after where necessary.



Botanical Name: *Eragrostis tenella* (Linn.) Beauv.
E. anabilis Wight & Arn.

Common Name: Feathery Eragrostis, Bugs' Egg Grass

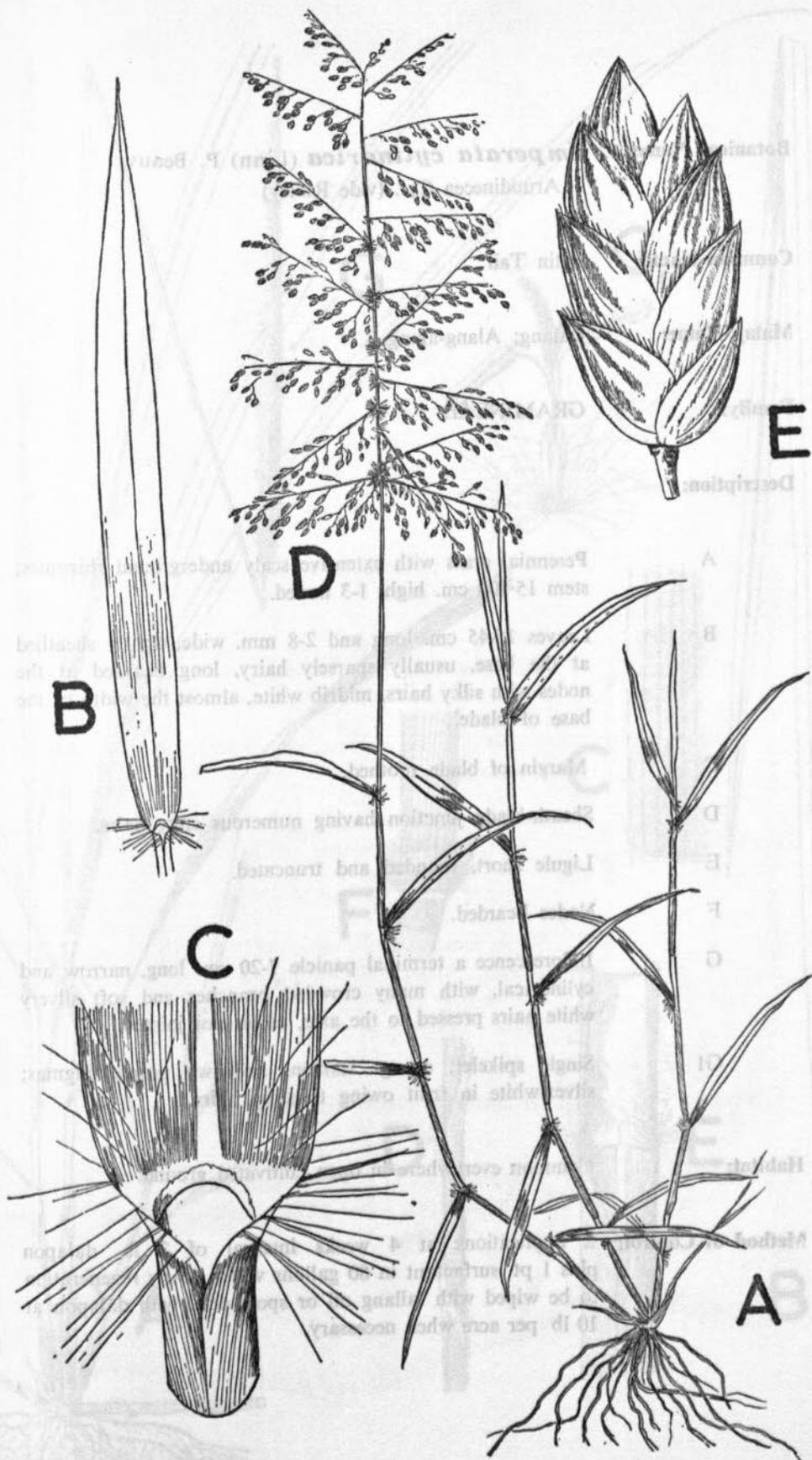
Family: GRAMINEAE

Description:

- A Annual; stem closely tufted and short, 20-30 high.
- B Leaves about 10 cm. long, narrow, soft.
- C Ligule membranous; leaf junction with sheath hairy.
- D Inflorescence a terminal panicle, pyramid shaped with short tender spreading branches, hairy at the nodes.
- E Spikelets with 3-6 bisexual florets, pale green tinged violet, anthers purple; flowering glume with stiff, slender spreading hairs on their keels.

Habitat: In open waste ground and grassy paths.

Method of Control: 3 pts Sordox HC plus 5 lb sodium chlorate plus 1 pt surfactant in 40 gallons water. Spot spray when necessary thereafter.



Botanical Name: *Imperata cylindrica* (Linn) P. Beauv.
I. Arundinecea Cyr. (vide Ridley)

Common Name: Satin Tail

Malay Name: Lalang; Alang-alang.

Family: GRAMINEAE

Description:

A Perennial grass with extensive scaly underground rhizomes; stem 15-100 cm. high, 1-3 noded.

B Leaves 15-45 cm. long and 2-8 mm. wide, tightly sheathed at the base, usually sparsely hairy, long bearded at the nodes with silky hairs, midrib white, almost the width of the base of blade.

C Margin of blade toothed.

D Sheath-blade junction having numerous silky hairs.

E Ligule short, rounded and truncated.

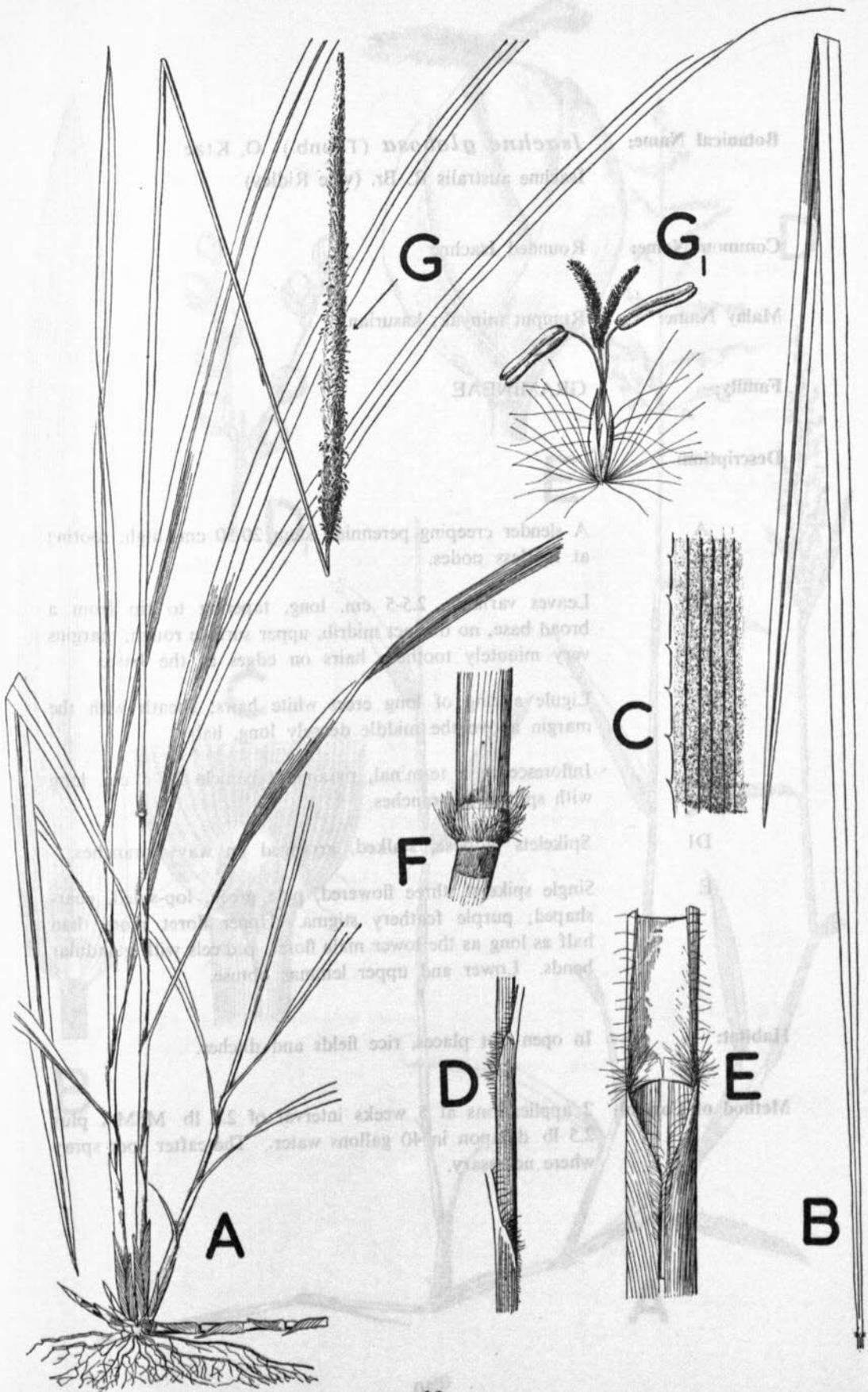
F Nodes bearded.

G Inflorescence a terminal panicle 7-20 cm. long, narrow and cylindrical, with many crowded branches and soft silvery white hairs pressed to the axis, rachis not jointed.

G1 Single spikelet; orange stamens and two purple stigmas; silver-white in fruit owing to silky hairs.

Habitat: Common everywhere in open cultivated ground.

Method of Control: 2 applications at 4 weeks interval of 7 lb dalapon plus 1 pt surfactant in 80 gallons water. Any regeneration to be wiped with lalang oil or spot spray with dalapon at 10 lb per acre when necessary.



Botanical Name: *Isachne globosa* (Thunb.) O. Ktze
Isachne australis R. Br. (vide Ridley)

Common Name: Rounded Isachne

Malay Name: Rumput minyak; kasurian

Family: GRAMINEAE

Description:

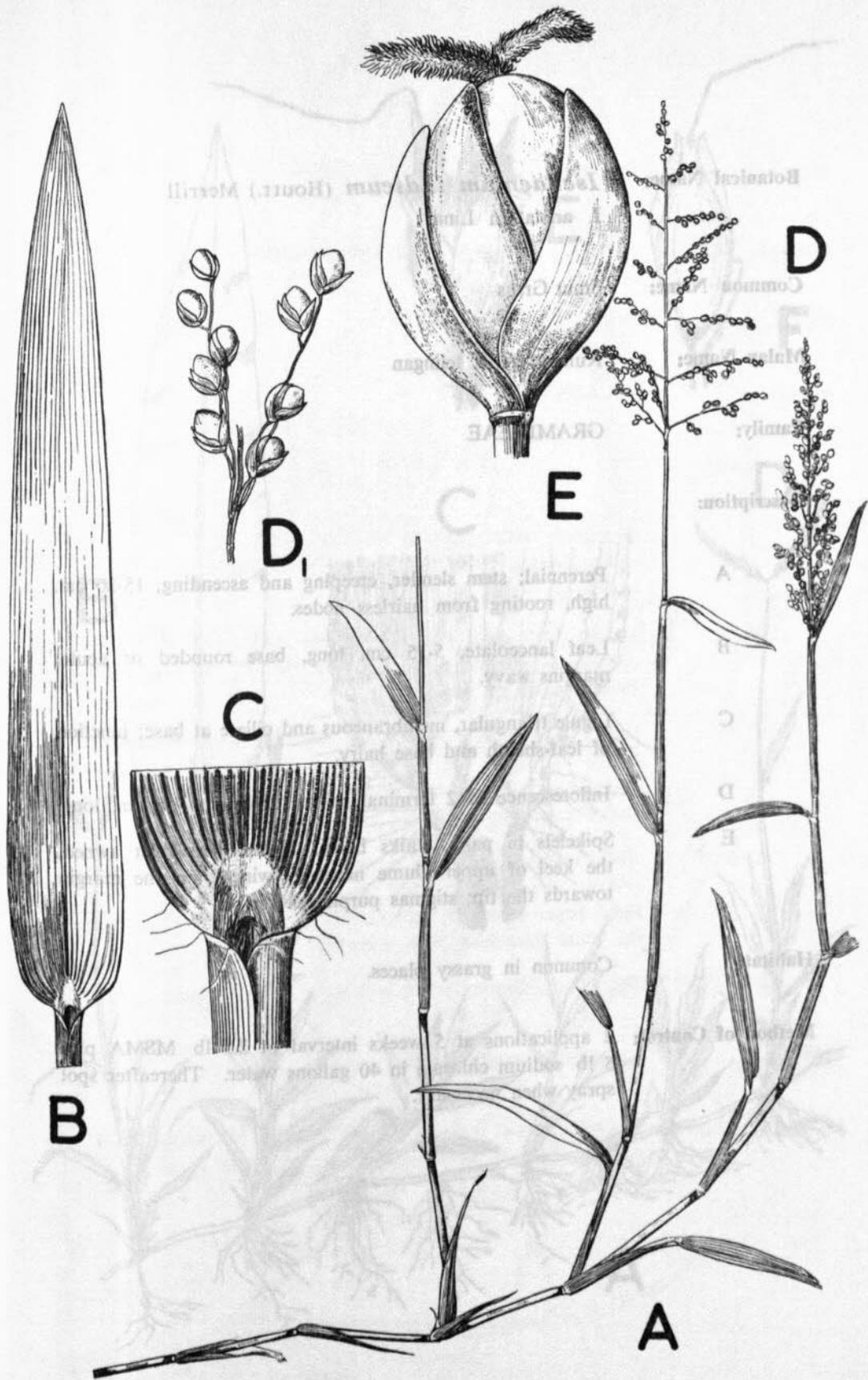
- A A slender creeping perennial; stem 20-50 cm. high, rooting at hairless nodes.
- B Leaves variable, 2.5-5 cm. long, tapering to tip from a broad base, no distinct midrib, upper surface rough, margins very minutely toothed, hairs on edges at the base.
- C Ligule a ring of long erect white hairs; sheath with the margin above the middle densely long, hairy.
- D Inflorescence a terminal, pyramidal panicle 2.5-4 cm. long with spreading branches.
- DI Spikelets globose, stalked, arranged on wavy branches.
- E Single spikelet, three flowered, pale green, lop-sided, pear-shaped; purple feathery stigma. Upper floret more than half as long as the lower male floret; pedicels with glandular bends. Lower and upper lemmas obtuse.

Habitat:

In open wet places, rice fields and ditches.

Method of Control:

2 applications at 5 weeks interval of 2.5 lb MSMA plus 2.5 lb dalapon in 40 gallons water. Thereafter spot spray where necessary.



Botanical Name: *Ischaemum indicum* (Houtt.) Merrill
I. aristatum Linn.

Common Name: Smut Grass

Malay Name: Rumput gerek telinga

Family: GRAMINEAE

Description:

A Perennial; stem slender, creeping and ascending, 15-30 cm. high, rooting from hairless nodes.

B Leaf lanceolate, 5-15 cm. long, base rounded or acute, margins wavy.

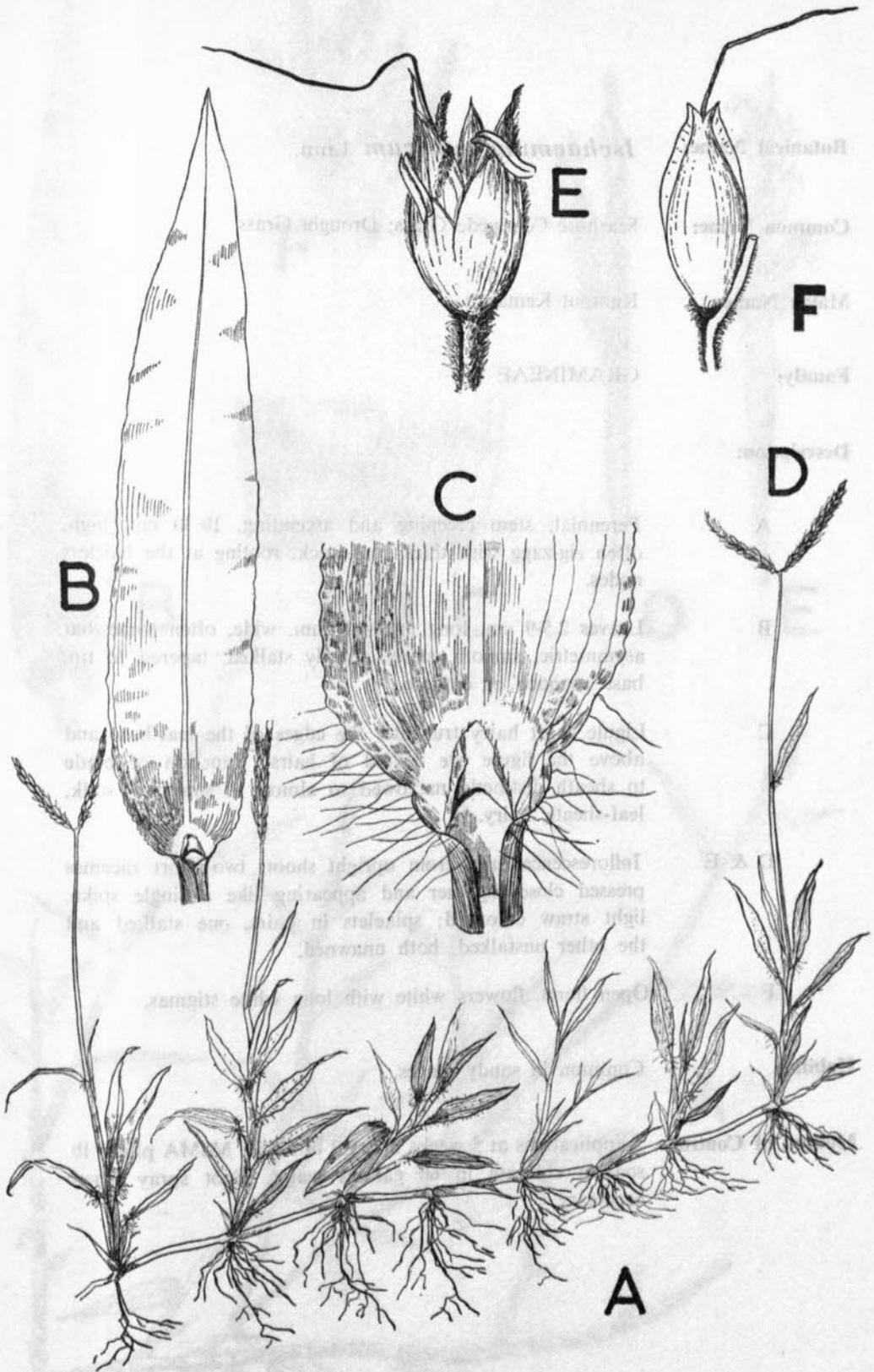
C Ligule triangular, membranous and ciliate at base; junction of leaf-sheath and base hairy.

D Inflorescence of 2 terminal spikes, divergent, 4-8 cm. long.

E Spikelets in pairs, stalks hairy, unstalked spikelet awned, the keel of upper glume narrowly winged on the margin towards the tip; stigmas purple feathery.

Habitat: Common in grassy places.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 5 lb sodium chlorate in 40 gallons water. Thereafter spot spray when necessary.





Botanical Name: *Ischaemum muticum* Linn.

Common Name: Seashore Centipede Grass; Drought Grass

Malay Name: Rumput Kemarau

Family: GRAMINEAE

Description:

A Perennial; stem creeping and ascending, 10-30 cm. high, often zig-zagg with thick root-stock, rooting at the hairless nodes.

B Leaves 2.5-9 cm. long and 4-6 mm. wide, often somewhat asymmetric, smooth, shiny, shortly stalked, tapered to tip, base rounded or cordate.

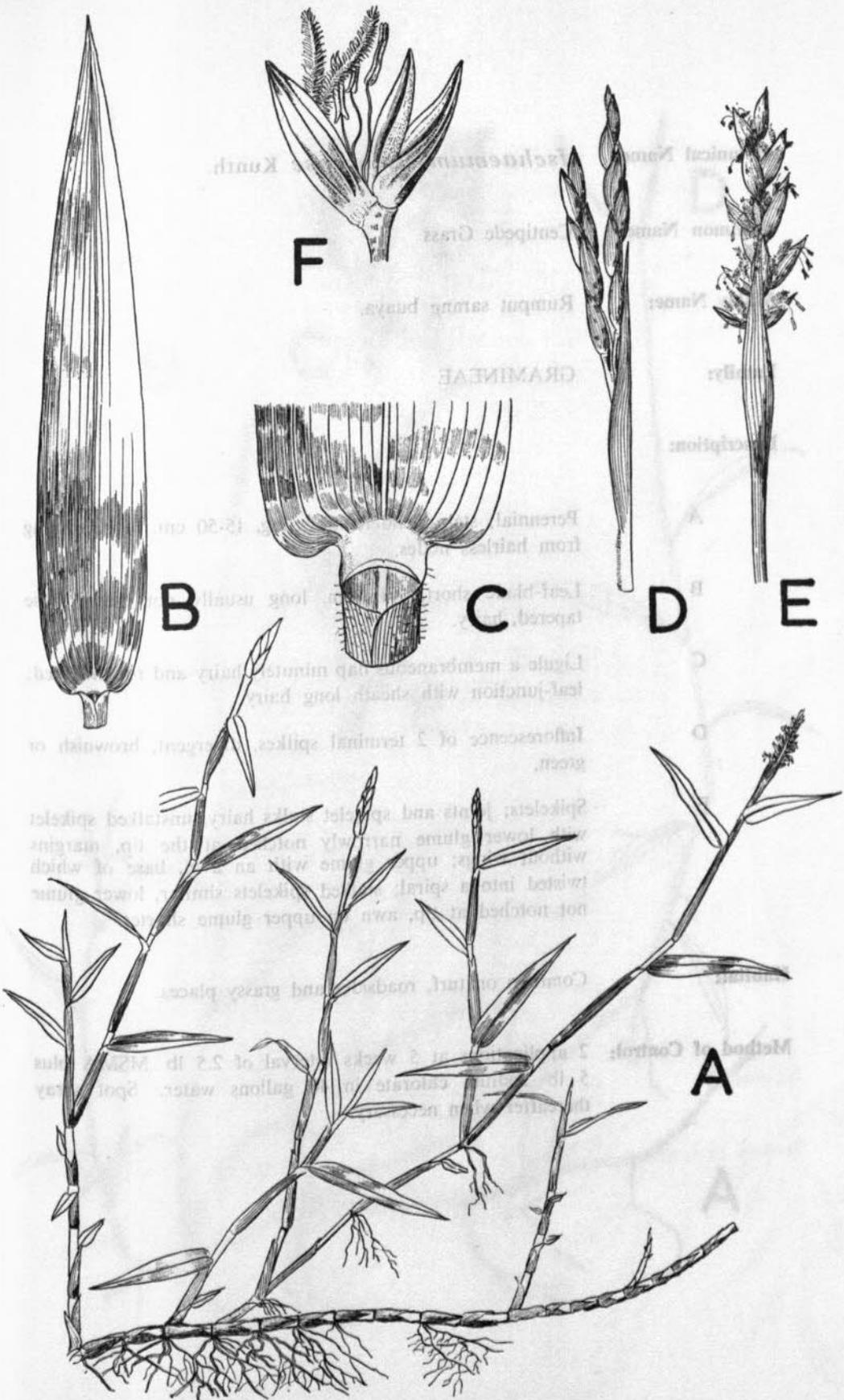
C Ligule short hairy truncate; the edges of the leaf-base and above the ligule are devoid of hairs. Junction of blade to sheath distinctly narrowed to almost a 'straplike' stalk, leaf-sheath hairy.

D & E Inflorescence arise from upright shoot; two short racemes pressed close together and appearing like a single spike, light straw coloured; spikelets in pairs, one stalked and the other unstalked, both unawned,

F Open floret, flowers white with long white stigmas.

Habitat: Common in sandy places.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb. MSMA plus 5 lb sodium chlorate in 60 gallons water. Spot spray where necessary.



Botanical Name: *Ischaemum timorense* Kunth.

Common Name: Centipede Grass

Malay Name: Rumput sarang buaya.

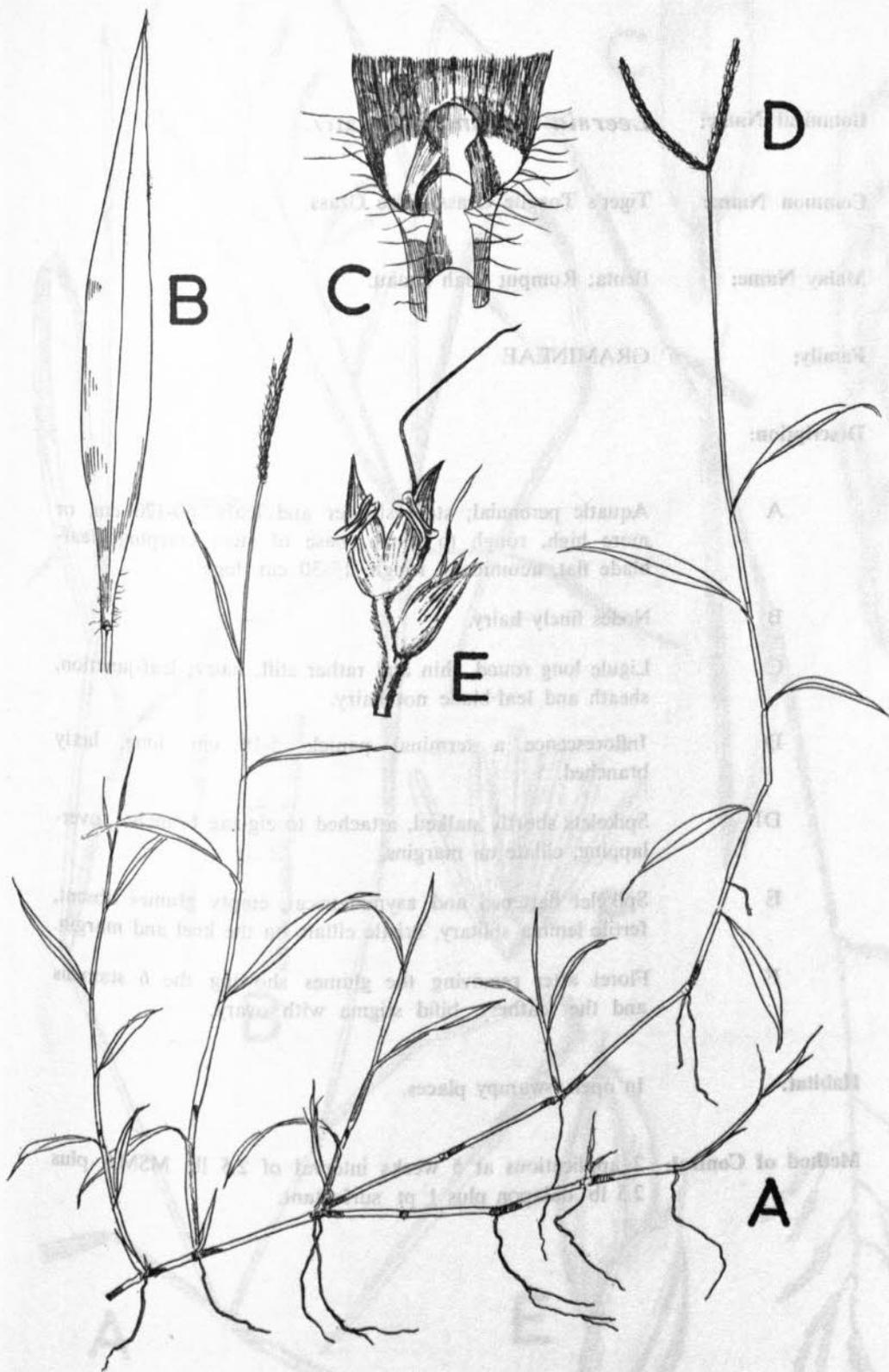
Family: GRAMINEAE

Description:

- A Perennial; stem slender, straggling, 15-50 cm. high, rooting from hairless nodes.
- B Leaf-blade short, 7-15 cm. long usually not hairy, base tapered, hairy.
- C Ligule a membranous flap minutely hairy and rough edged; leaf-junction with sheath long hairy.
- D Inflorescence of 2 terminal spikes, divergent, brownish or green.
- E Spikelets; joints and spikelet stalks hairy, unstalked spikelet with lower glume narrowly notched at the tip, margins without wings; upper glume with an awn, base of which twisted into a spiral; stalked spikelets similar, lower glume not notched at tip, awn on upper glume shorter.

Habitat: Common on turf, roadsides and grassy places.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 5 lb sodium chlorate in 40 gallons water. Spot spray thereafter when necessary.



Botanical Name: *Leersia hexandra* Swartz.

Common Name: Tiger's Tongue Grass, Rice Grass

Malay Name: Benta; Rumput lidah rimau.

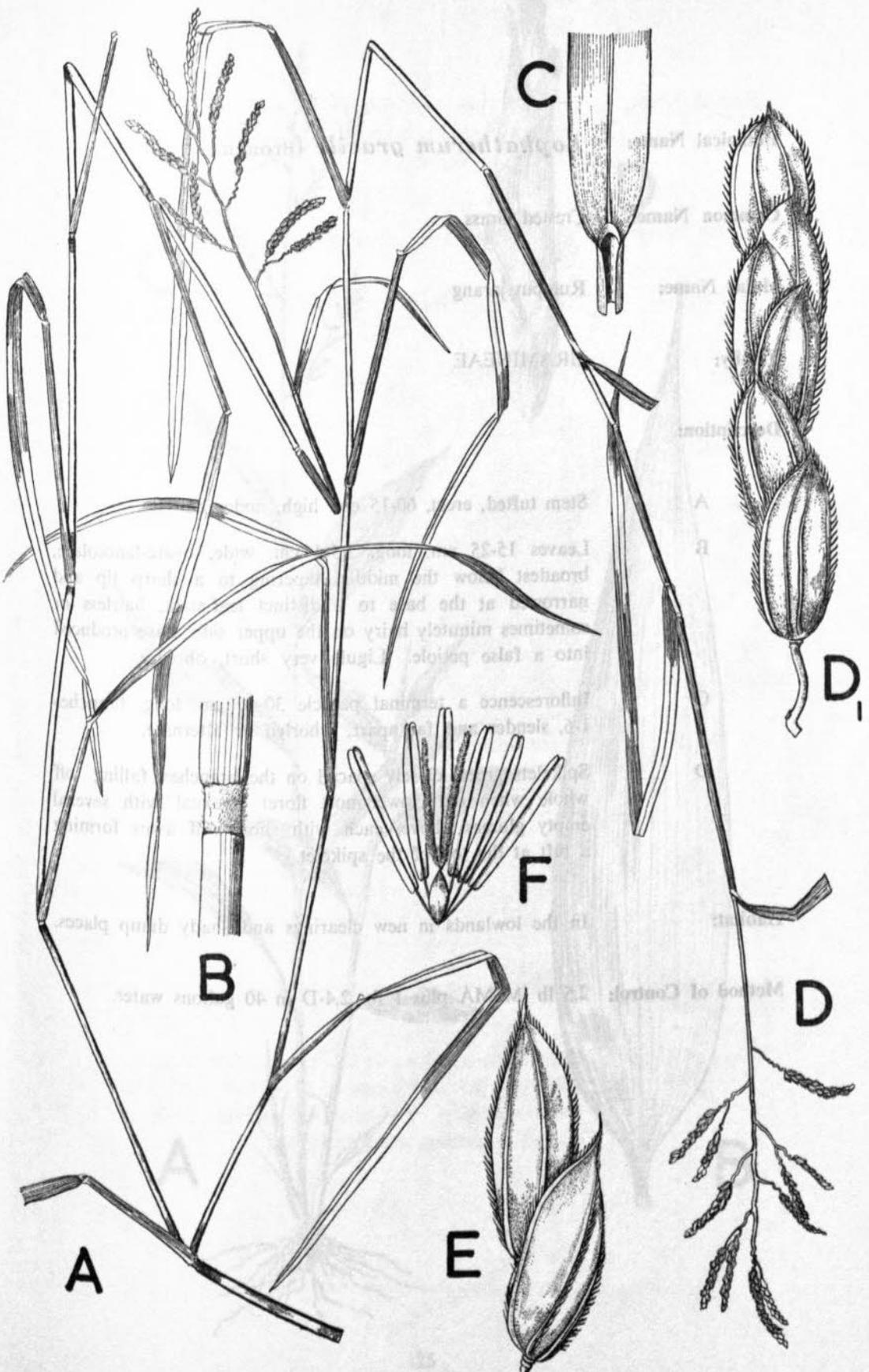
Family: GRAMINEAE

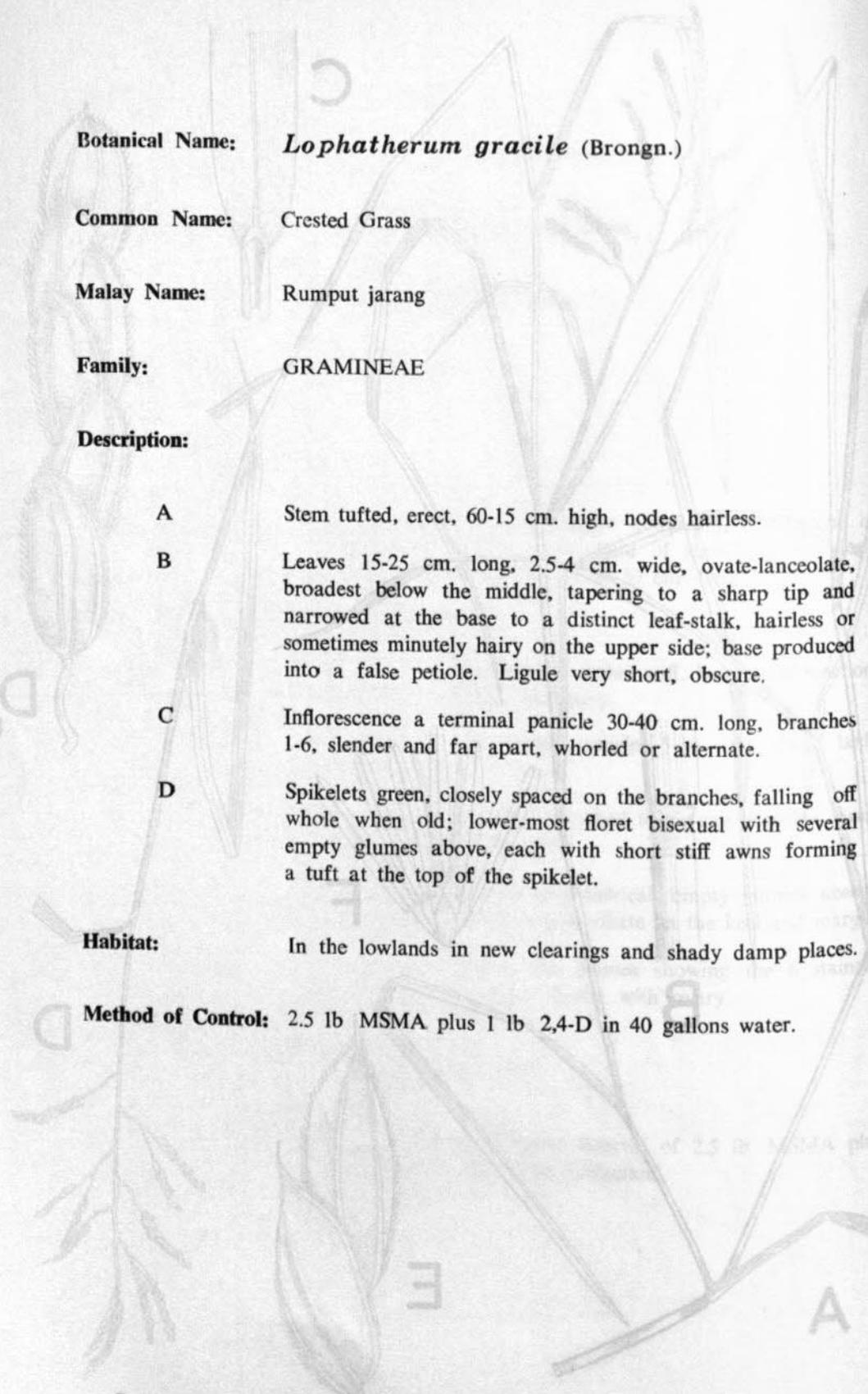
Description:

- A Aquatic perennial; stem slender and leafy, 60-120 cm. or more high, rough to touch, base of stem creeping; leaf-blade flat, acuminate, rough, 15-30 cm. long.
- B Nodes finely hairy.
- C Ligule long round, thin and rather stiff, hairy; leaf-junction, sheath and leaf-blade not hairy.
- D Inflorescence a terminal panicle 5-10 cm. long, laxly branched.
- DI Spikelets shortly stalked, attached to zig-zag branches, overlapping, ciliate on margins.
- E Spikelet flattened and asymmetrical, empty glumes absent, fertile lemma solitary, bristle ciliate on the keel and margin.
- F Floret after removing the glumes showing the 6 stamens and the feathery, bifid stigma with ovary.

Habitat: In open, swampy places.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 2.5 lb dalapon plus 1 pt surfactant.





Botanical Name: *Lophatherum gracile* (Brongn.)

Common Name: Crested Grass

Malay Name: Rumput jarang

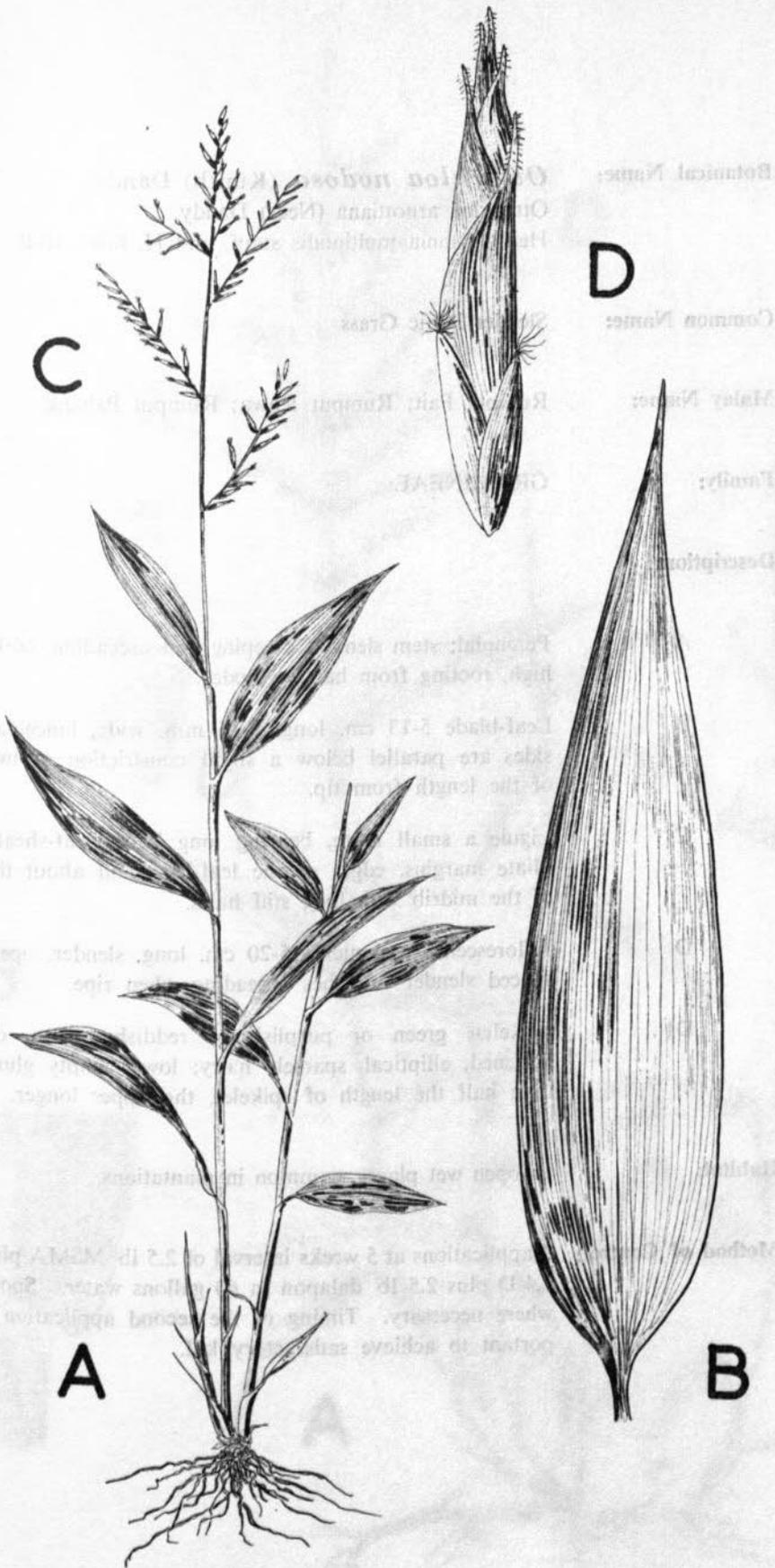
Family: GRAMINEAE

Description:

- A Stem tufted, erect, 60-15 cm. high, nodes hairless.
- B Leaves 15-25 cm. long, 2.5-4 cm. wide, ovate-lanceolate, broadest below the middle, tapering to a sharp tip and narrowed at the base to a distinct leaf-stalk, hairless or sometimes minutely hairy on the upper side; base produced into a false petiole. Ligule very short, obscure.
- C Inflorescence a terminal panicle 30-40 cm. long, branches 1-6, slender and far apart, whorled or alternate.
- D Spikelets green, closely spaced on the branches, falling off whole when old; lower-most floret bisexual with several empty glumes above, each with short stiff awns forming a tuft at the top of the spikelet.

Habitat: In the lowlands in new clearings and shady damp places.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water.



Botanical Name: *Ottochloa nodosa* (Kunth) Dandy
Ottochloa arnottiana (Nees) Dandy
Hemingymnia multinodis stapf. and *H. fusca* Ridl.

Common Name: Slender Panic Grass

Malay Name: Rumput Pait; Rumput Rawa; Rumput Pahang.

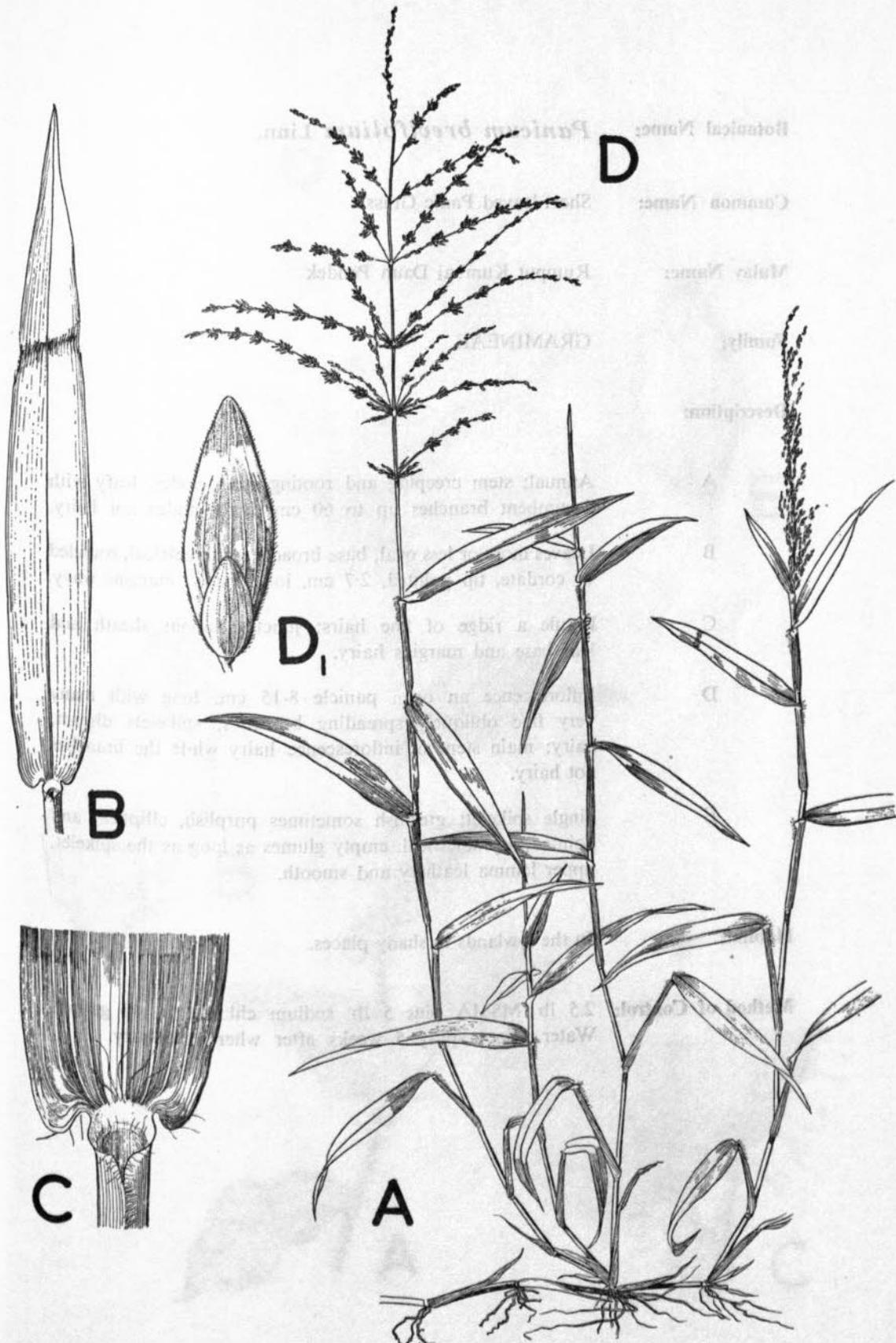
Family: GRAMINEAE

Description:

- A Perennial; stem slender, creeping and ascending, 60-100 cm. high, rooting from hairless nodes.
- B Leaf-blade 5-13 cm. long, 8-16 mm. wide, lanceolate; the sides are parallel below a slight constriction at two-fifths of the length from tip.
- C Ligule a small ridge, bearing long hairs, leaf-sheath with aliolate margins, edges of the leaf-base and about the base of the midrib with long stiff hairs.
- D Inflorescence a panicle 15-20 cm. long, slender, open, with spaced slender branches spreading when ripe.
- D1 Spikelets green or purplish or reddish brown, dorsally flattened, elliptical, sparsely hairy; lower empty glume less than half the length of spikelet, the upper longer.

Habitat: In open wet places, common in plantations.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D plus 2.5 lb dalapon in 60 gallons water. Spot spray where necessary. Timing of the second application is important to achieve satisfactory kill.



Botanical Name: *Panicum brevifolium* Linn.

Common Name: Short-leaved Panic Grass

Malay Name: Rumput Kumbai Daun Pendek

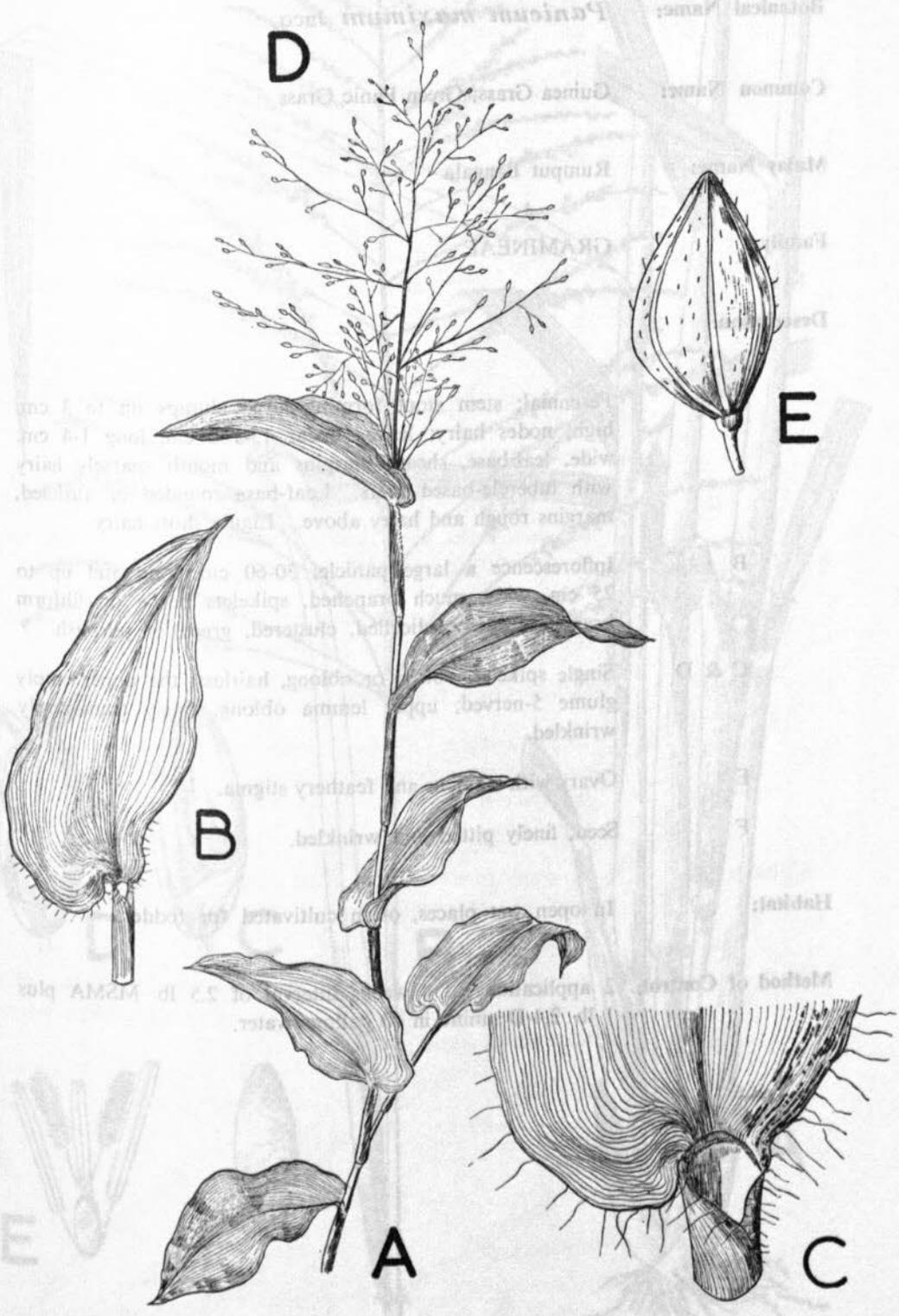
Family: GRAMINEAE

Description:

- A Annual; stem creeping and rooting from nodes, leafy with decumbent branches up to 60 cm. high, nodes not hairy.
- B Leaves more or less oval, base broadly asymmetrical, rounded or cordate, tip pointed, 2-7 cm. long, hairy, margins wavy.
- C Ligule a ridge of fine hairs; junction about sheath and leaf base and margins hairy.
- D Inflorescence an open panicle 8-15 cm. long with many very fine obliquely spreading branches; spikelets distant, hairy; main stem of inflorescence hairy while the branches not hairy.
- E Single spikelet; greenish sometimes purplish, elliptical and pointed, asymmetrical, empty glumes as long as the spikelet, upper lemma leathery and smooth.

Habitat: In the lowlands in shady places.

Method of Control: 2.5 lb MSMA plus 5 lb sodium chlorate in 40 gallons Water. Spot spray 5 weeks after where necessary.



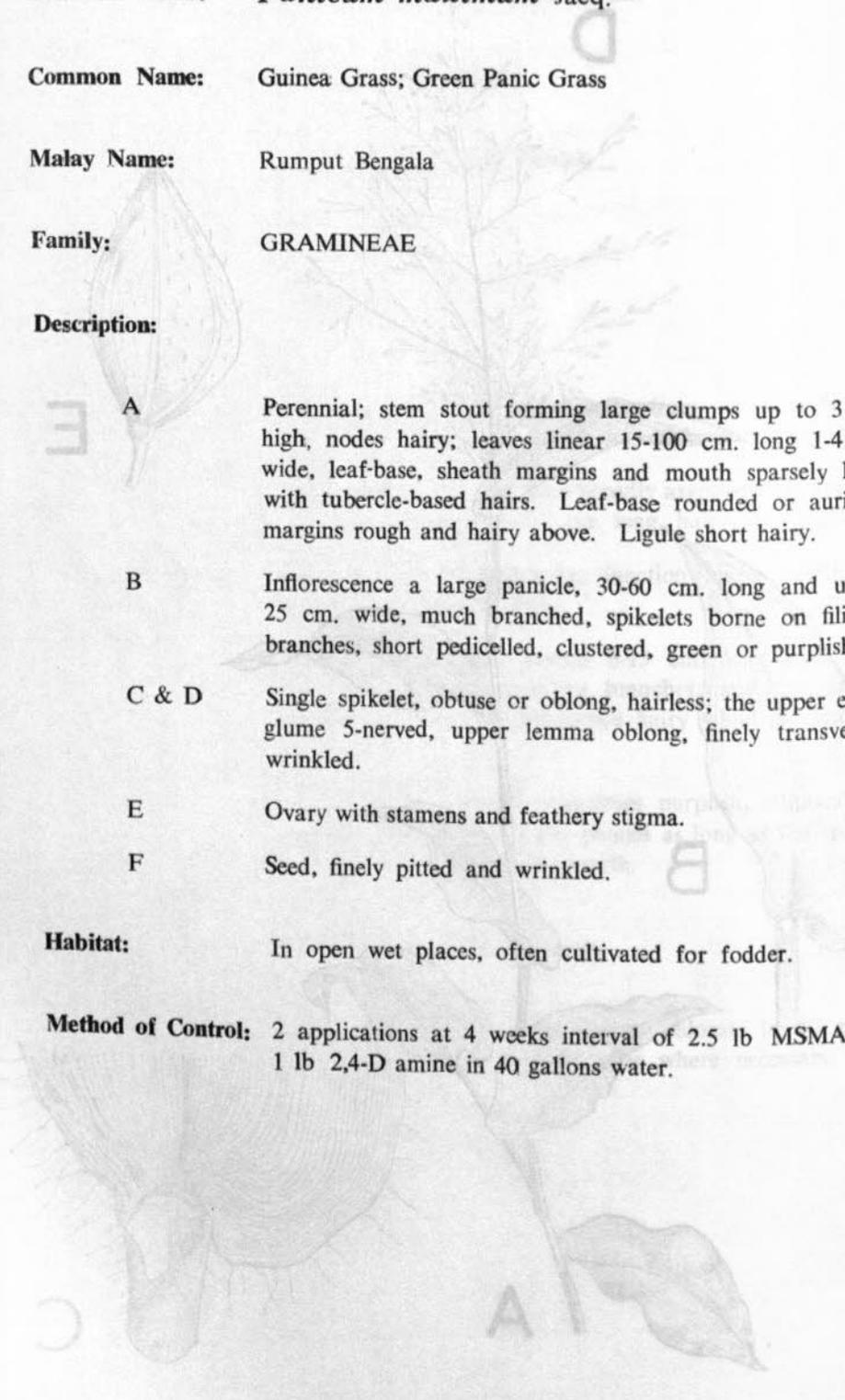
Botanical Name: *Panicum maximum* Jacq.

Common Name: Guinea Grass; Green Panic Grass

Malay Name: Rumput Bengala

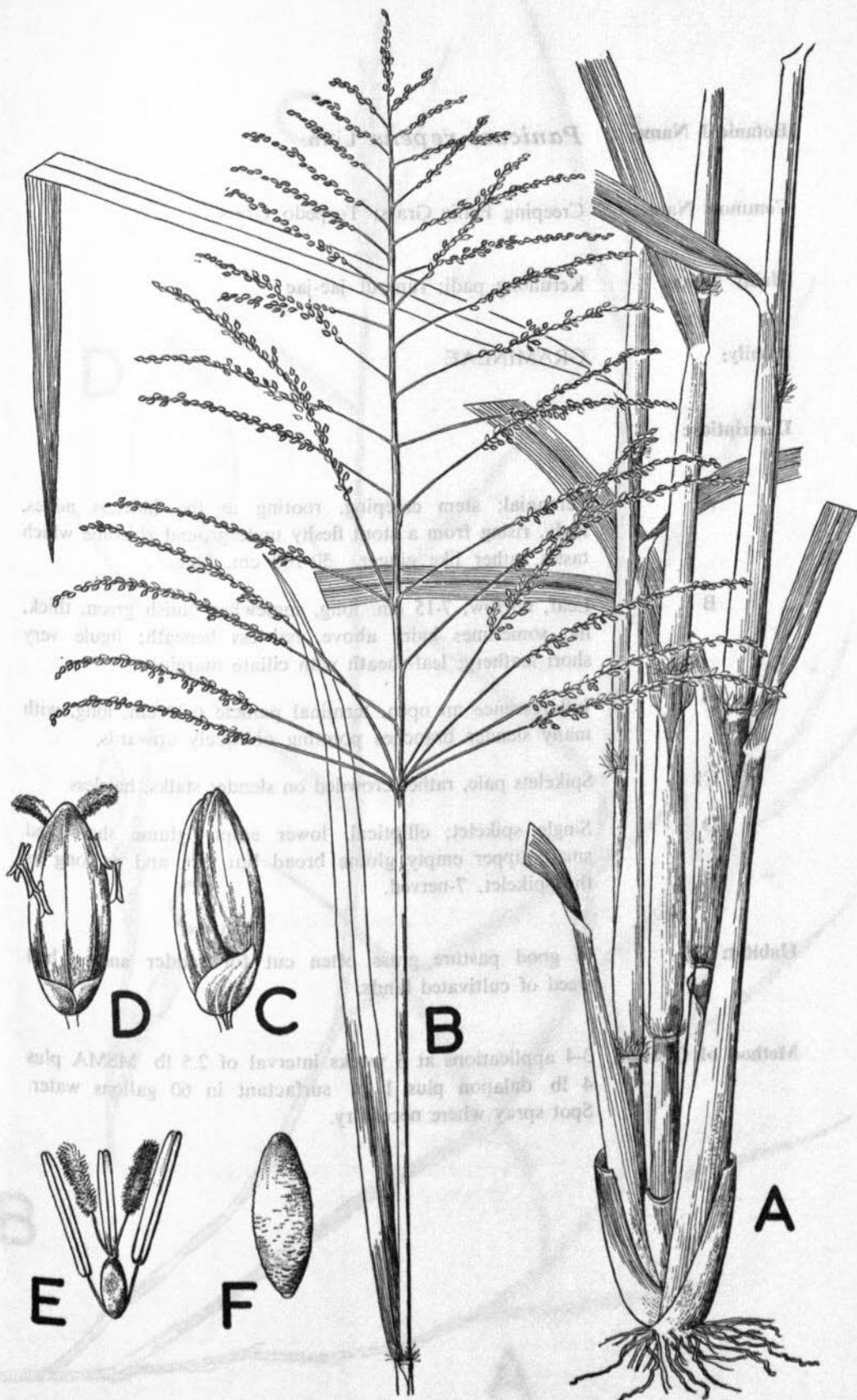
Family: GRAMINEAE

Description:

- 
- A Perennial; stem stout forming large clumps up to 3 cm. high, nodes hairy; leaves linear 15-100 cm. long 1-4 cm. wide, leaf-base, sheath margins and mouth sparsely hairy with tubercle-based hairs. Leaf-base rounded or auricled, margins rough and hairy above. Ligule short hairy.
- B Inflorescence a large panicle, 30-60 cm. long and up to 25 cm. wide, much branched, spikelets borne on filiform branches, short pedicelled, clustered, green or purplish.
- C & D Single spikelet, obtuse or oblong, hairless; the upper empty glume 5-nerved, upper lemma oblong, finely transversely wrinkled.
- E Ovary with stamens and feathery stigma.
- F Seed, finely pitted and wrinkled.

Habitat: In open wet places, often cultivated for fodder.

Method of Control: 2 applications at 4 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D amine in 40 gallons water.



Botanical Name: *Panicum repens* Linn.

Common Name: Creeping Panic Grass; Torpedo Grass

Malay Name: Kerunong padi; rumput jae-jae

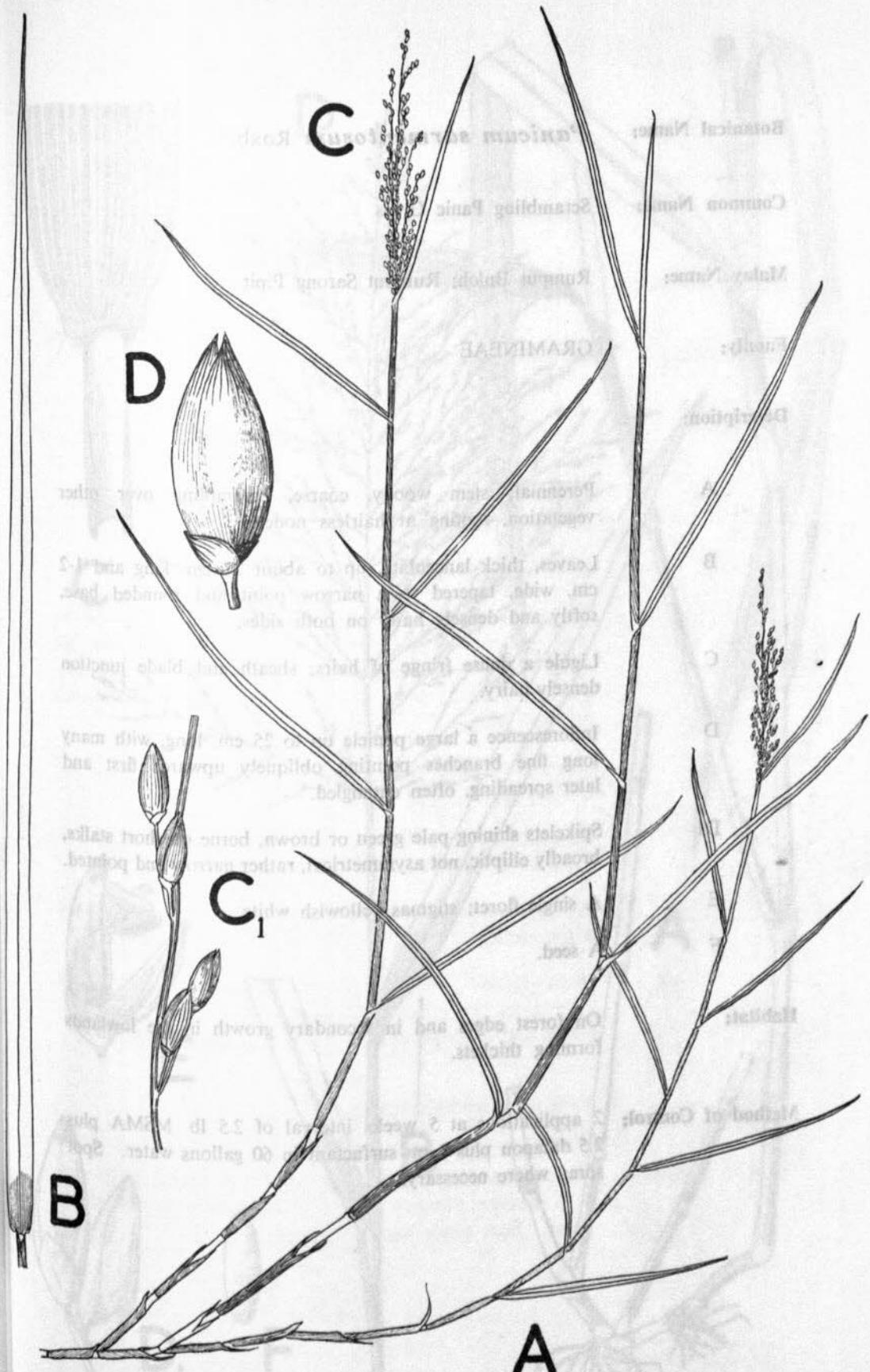
Family: GRAMINEAE

Description:

- A Perennial; stem creeping, rooting at the hairless nodes, leafy, rising from a stout fleshy underground rhizome which tastes rather like ginger. 30-100 cm. high.
- B Leaf, narrow, 7-15 cm. long, somewhat bluish green, thick, flat sometimes hairy above, hairless beneath; ligule very short leathery; leaf-sheath with ciliate margins.
- C Inflorescence an open, terminal panicle 6-20 cm. long, with many slender branches pointing obliquely upwards.
- C1 Spikelets pale, rather crowded on slender stalks, hairless.
- D Single spikelet; elliptical, lower empty glume short and small, upper empty glume broad but thin and as long as the spikelet, 7-nerved.

Habitat: A good pasture grass often cut for fodder and a bad weed of cultivated lands.

Method of Control: 3-4 applications at 5 weeks interval of 2.5 lb MSMA plus 4 lb dalapon plus 1 pt surfactant in 60 gallons water. Spot spray where necessary.



Botanical Name: *Panicum sarmentosum* Roxb.

Common Name: Scrambling Panic Grass

Malay Name: Rumput Buloh; Rumput Sarong Pipit

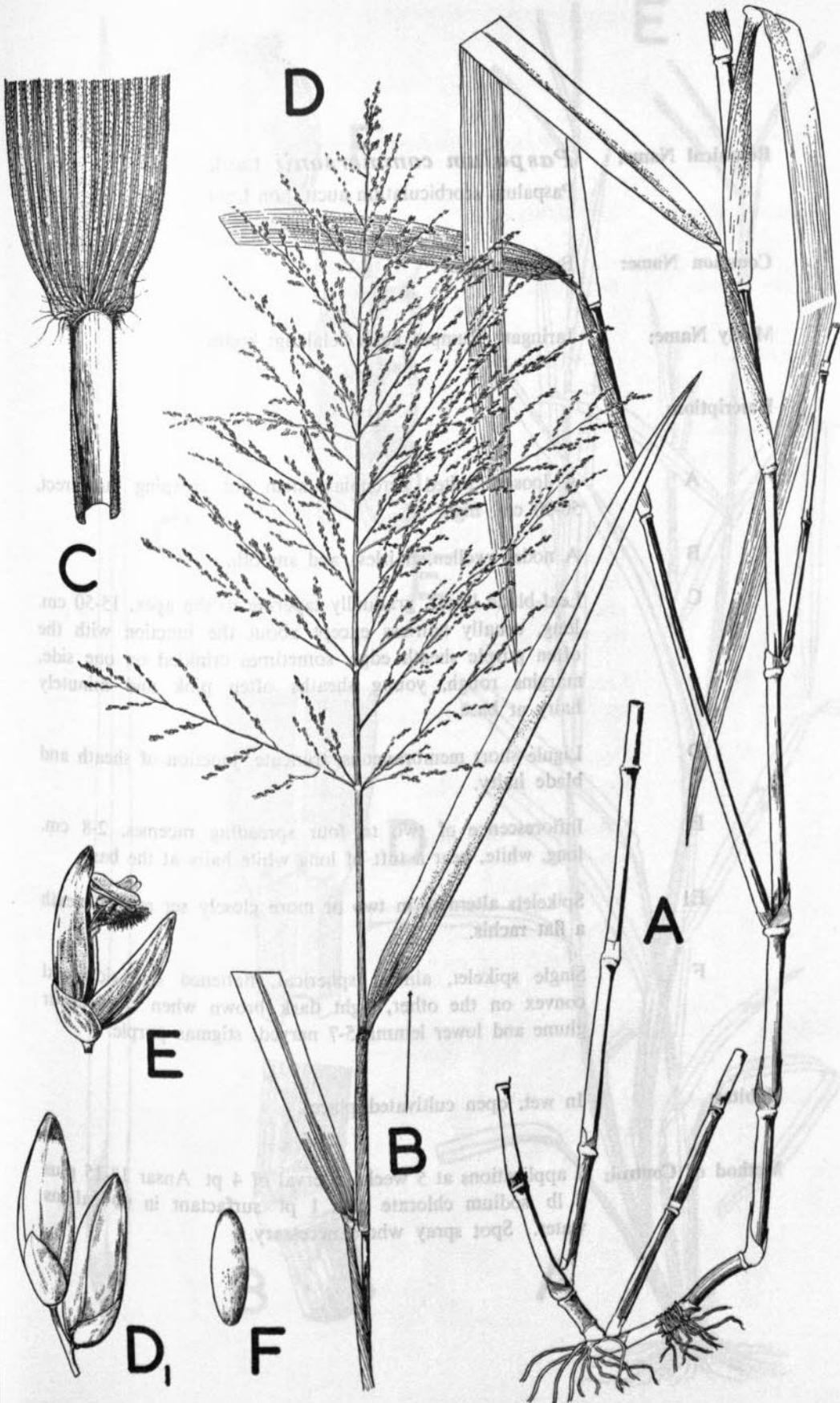
Family: GRAMINEAE

Description:

- A Perennial; stem woody, coarse, scrambling over other vegetation, rooting at hairless nodes.
- B Leaves, thick lanceolate, up to about 25 cm. long and 1-2 cm. wide, tapered to a narrow point and rounded base, softly and densely hairy on both sides.
- C Ligule a dense fringe of hairs; sheath and blade junction densely hairy.
- D Inflorescence a large panicle up to 25 cm. long, with many long fine branches pointing obliquely upwards first and later spreading, often entangled.
- DI Spikelets shining pale green or brown, borne on short stalks, broadly elliptic, not asymmetrical, rather narrow and pointed.
- E A single floret; stigmas yellowish white.
- F A seed.

Habitat: On forest edges and in secondary growth in the lowlands forming thickets.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 2.5 dalapon plus 1 pt surfactant in 60 gallons water. Spot spray where necessary.



Botanical Name: *Paspalum commersonii* Lank
Paspalum scorbiculatum auctt. non Linn.

Common Name: Bull Paspalum

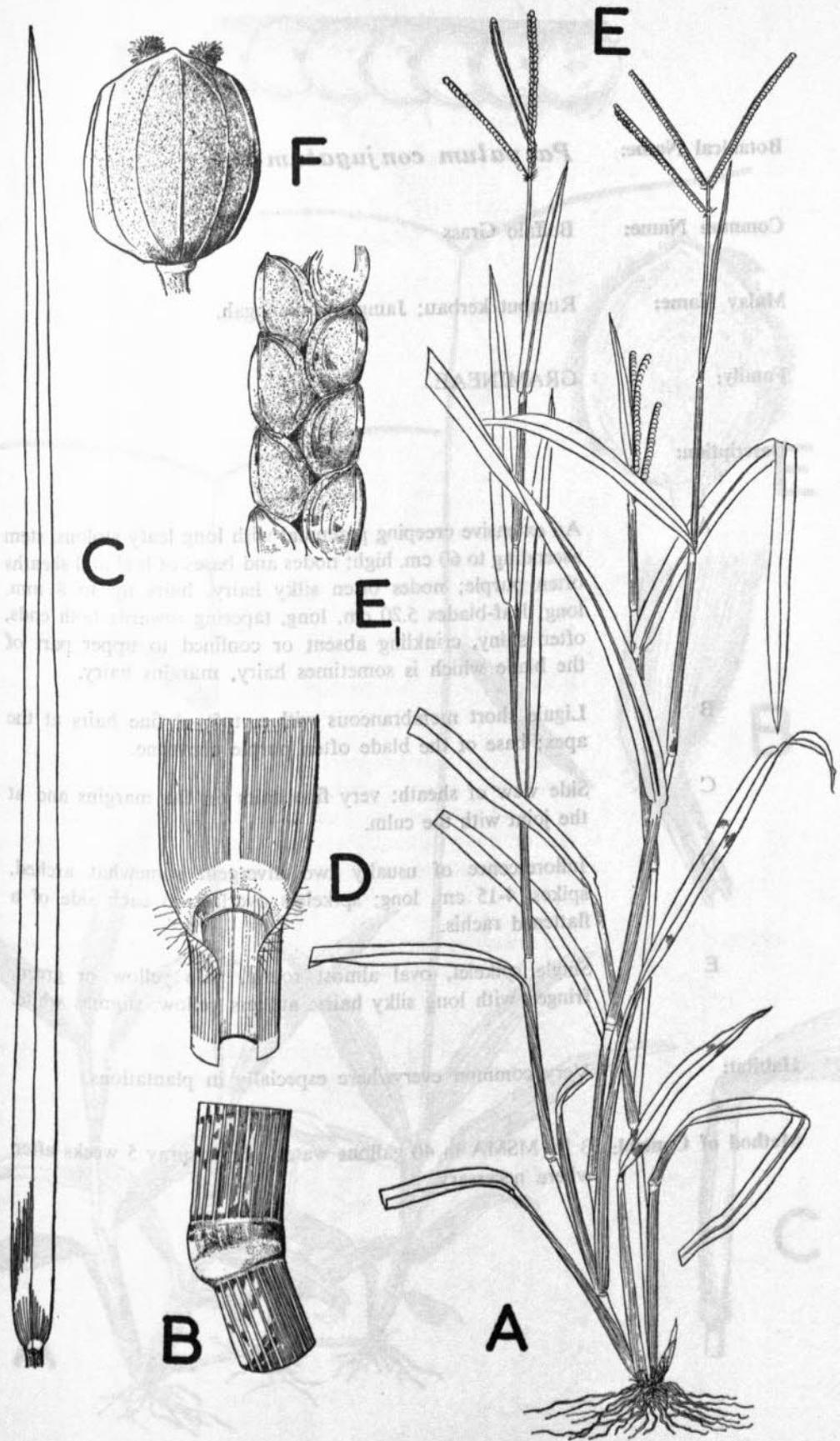
Malay Name: Jaringan; Rumpuk ketih belalang; kodra

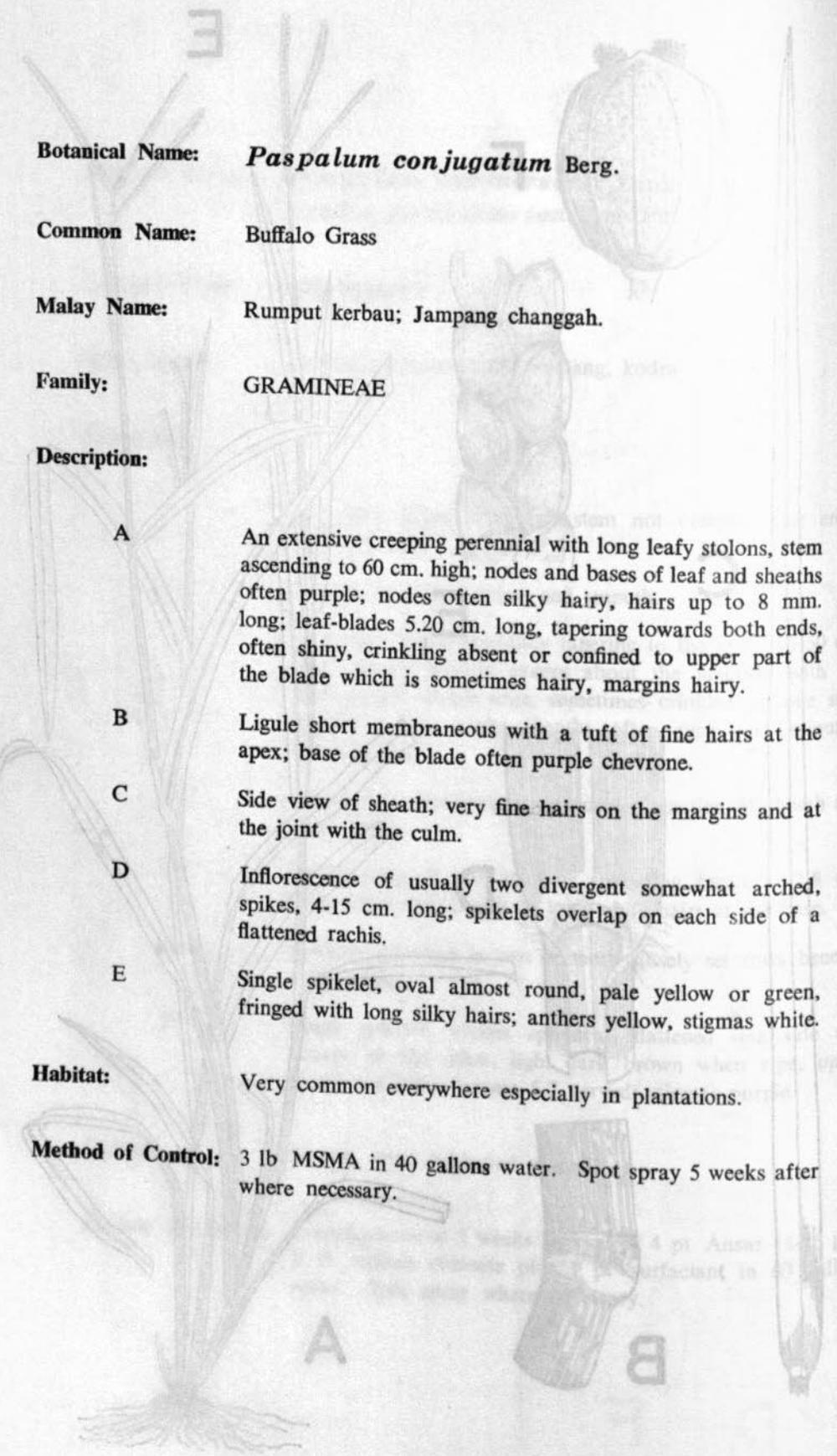
Description:

- A A loosely tufted perennial; stem not creeping but erect, 50-90 cm. high.
- B A node, swollen, hairless and smooth.
- C Leaf-blade linear, gradually tapering to the apex, 15-50 cm. long, usually hairless except about the junction with the often purple sheath edge, sometimes crinkled on one side, margins rough, young sheaths often pink and minutely hairy at base.
- D Ligule short membranous, truncate; junction of sheath and blade hairy.
- E Inflorescence of two to four spreading racemes, 2-8 cm. long, white, bear a tuft of long white hairs at the base.
- E1 Spikelets alternate in two or more closely set rows beneath a flat rachis.
- F Single spikelet, almost spherical, flattened one side and convex on the other, light dark brown when ripe, upper glume and lower lemma 5-7 nerved; stigmas purple.

Habitat: In wet, open cultivated places.

Method of Control: 2 applications at 5 weeks interval of 4 pt Ansar 18-15 plus 5 lb sodium chlorate plus 1 pt surfactant in 60 gallons water. Spot spray where necessary.





Botanical Name: *Paspalum conjugatum* Berg.

Common Name: Buffalo Grass

Malay Name: Rumput kerbau; Jampang changgah.

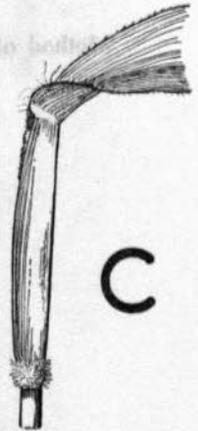
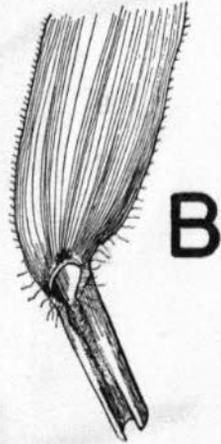
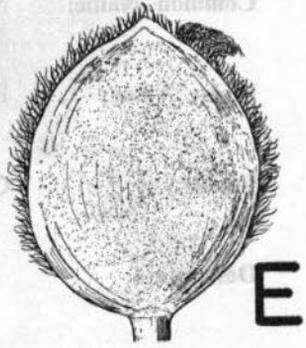
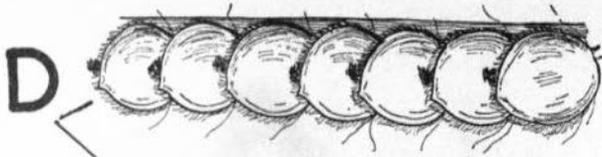
Family: GRAMINEAE

Description:

- A** An extensive creeping perennial with long leafy stolons, stem ascending to 60 cm. high; nodes and bases of leaf and sheaths often purple; nodes often silky hairy, hairs up to 8 mm. long; leaf-blades 5.20 cm. long, tapering towards both ends, often shiny, crinkling absent or confined to upper part of the blade which is sometimes hairy, margins hairy.
- B** Ligule short membranous with a tuft of fine hairs at the apex; base of the blade often purple chevrone.
- C** Side view of sheath; very fine hairs on the margins and at the joint with the culm.
- D** Inflorescence of usually two divergent somewhat arched, spikes, 4-15 cm. long; spikelets overlap on each side of a flattened rachis.
- E** Single spikelet, oval almost round, pale yellow or green, fringed with long silky hairs; anthers yellow, stigmas white.

Habitat: Very common everywhere especially in plantations.

Method of Control: 3 lb MSMA in 40 gallons water. Spot spray 5 weeks after where necessary.





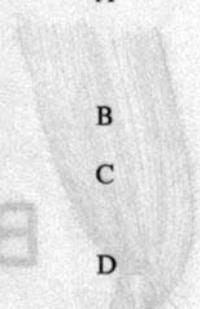
Botanical Name: *Pennisetum purpureum* Schum.

Common Name: Napier Grass; Elephant Grass

Malay Name: Rumput Gajah (rumput changgau)

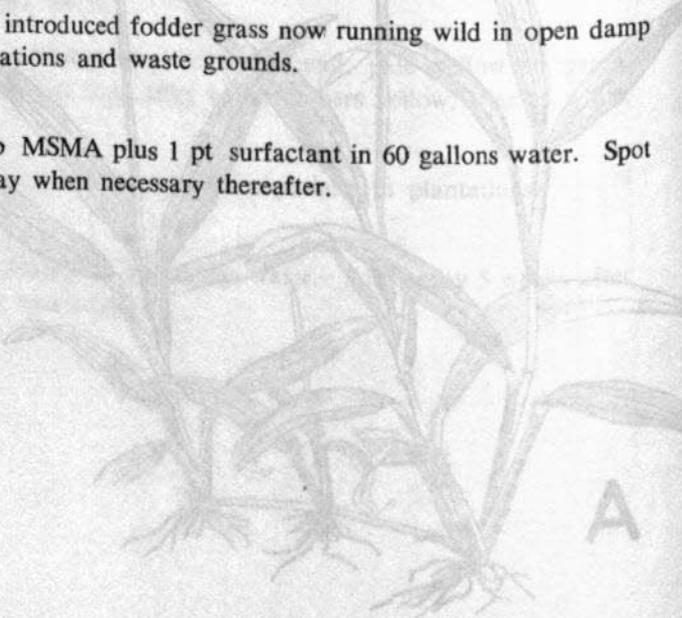
Family: GRAMINEAE

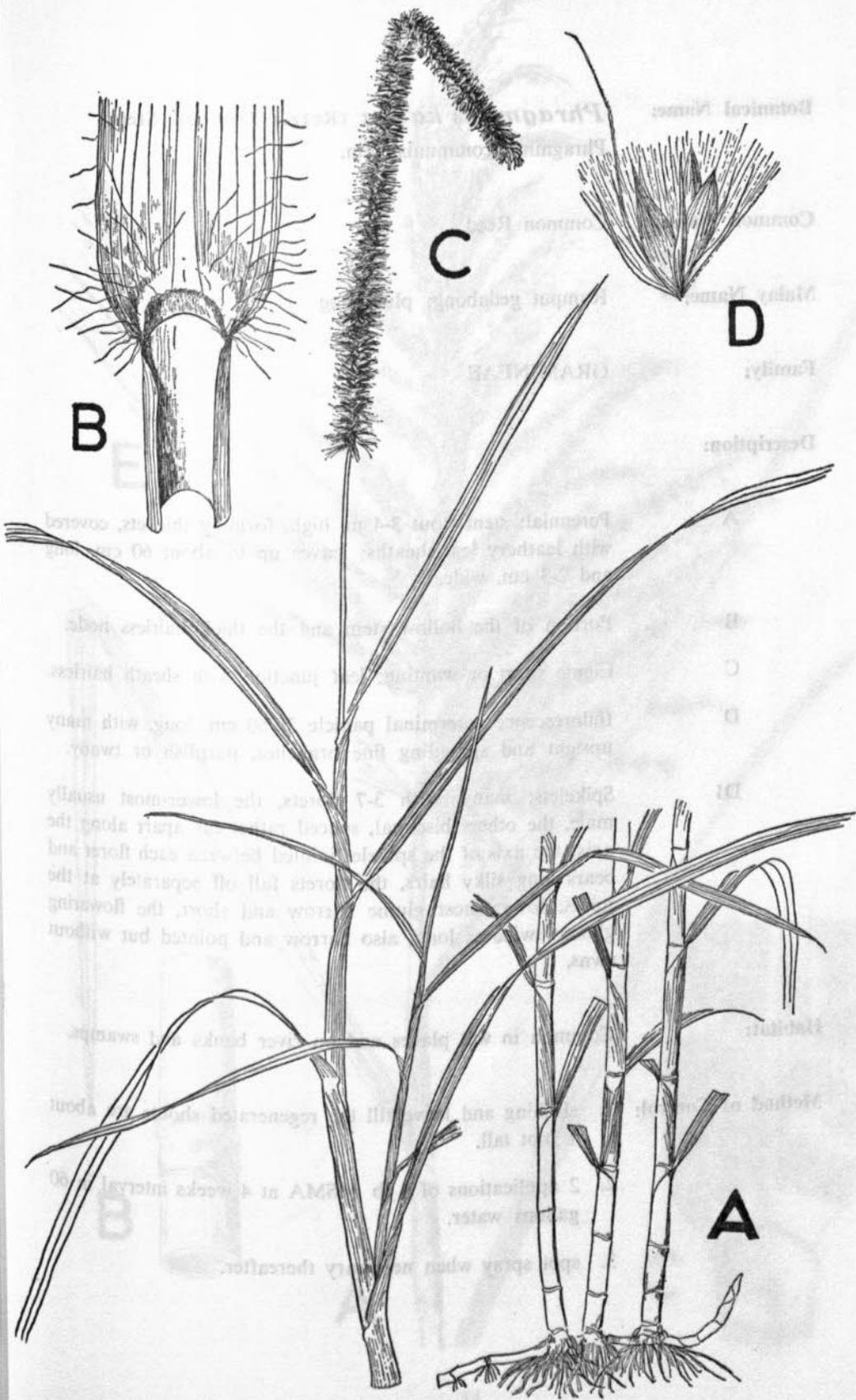
Description:

- 
- A A stout perennial; stem tufted, 3 m. or more high, nodes hairless; leaves up to 50 cm. long and 2-3 cm. wide, leaf-blade hairy, rough on margins.
- B Ligule a ridge of dense hairs; leaf-junction with sheath hairy.
- C Inflorescence, a long narrow terminal spike 15-30 cm. long, dense, yellowish and bristly.
- D Spikelets narrow and pointed, in groups of 1-3, male spikelets distinctly stalked, bisexual spikelets hardly stalked; each group of spikelets surrounded by a ring of slender bristles one of which is longer and stouter than the rest; the whole group of spikelets and bristles fall off together.

Habitat: An introduced fodder grass now running wild in open damp situations and waste grounds.

Method of Control: 4 lb MSMA plus 1 pt surfactant in 60 gallons water. Spot spray when necessary thereafter.





Botanical Name: *Phragmites karka* (Retz.) Trin. ex. Steud.
Phragmites communis Trin.

Common Name: Common Reed

Malay Name: Rumput gedabong; plumpung

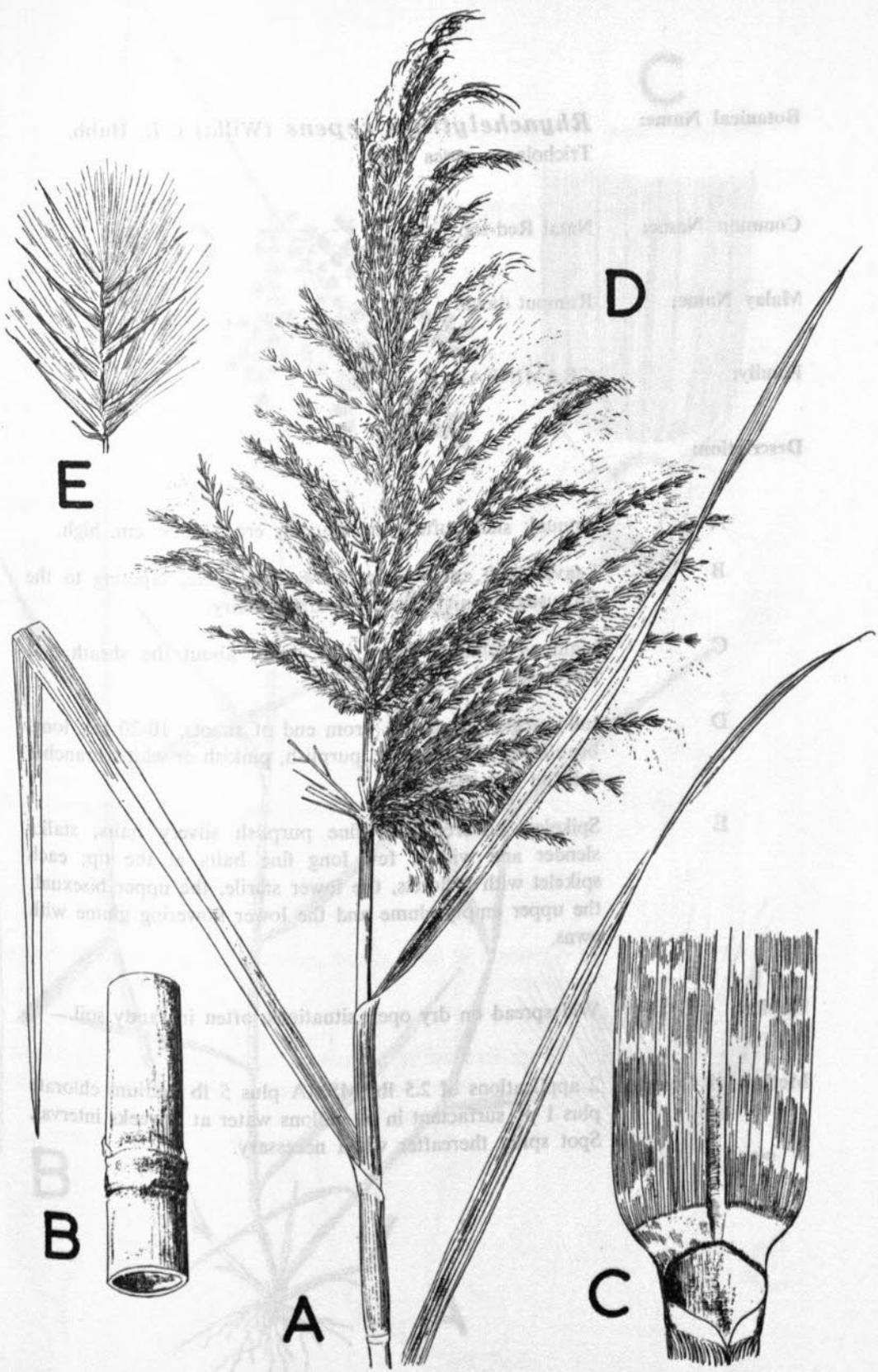
Family: GRAMINEAE

Description:

- A Perennial; stem stout 3-4 m. high, forming thickets, covered with leathery leaf-sheaths; leaves up to about 60 cm. long and 2-3 cm. wide.
- B Portion of the hollow stem and the thick hairless node.
- C Ligule short or wanting; leaf junction with sheath hairless.
- D Inflorescence a terminal panicle 30-60 cm. long, with many upright and spreading fine branches, purplish or twany.
- D1 Spikelets; many, with 3-7 florets, the lower-most usually male, the others bisexual, spaced rather far apart along the axis; the axis of the spikelet jointed between each floret and bears long silky hairs, the florets fall off separately at the joints; lower most glume narrow and short, the flowering glumes twice as long, also narrow and pointed but without awns.

Habitat: Common in wet places and on river banks and swamps.

- Method of Control:**
1. slashing and leave till the regenerated shoots are about 1 foot tall.
 2. 2 applications of 4 lb MSMA at 4 weeks interval in 60 gallons water.
 3. spot spray when necessary thereafter.



Botanical Name: *Rhynchelytrum repens* (Willd) C.E. Hubb.
Tricholaena rosea Nees.

Common Name: Natal Red-top Grass

Malay Name: Rumput dawai

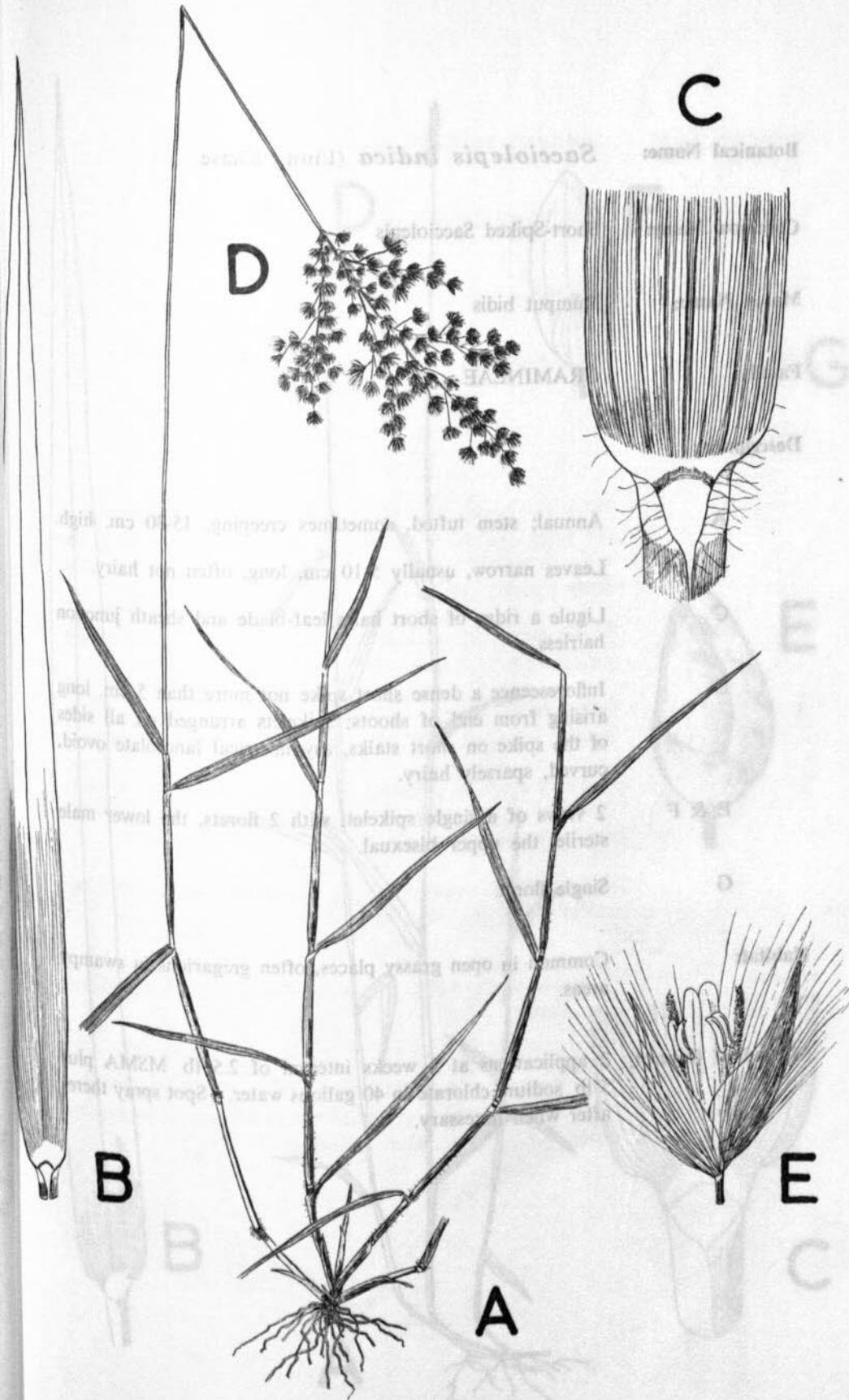
Family: GRAMINEAE

Description:

- A Annual; stem tufted and slender, erect, 30-9 cm. high.
- B Leaves 5-20 cm. long and 2-8 mm. wide, tapering to the tip, usually hairy, sheath sparsely hairy.
- C Ligule a minutely hairy rim; hairy about the sheath and leaf-base.
- D Inflorescence a panicle from end of shoots, 10-20 cm. long, beautifully silky reddish, purplish, pinkish or white, branches delicate and spreading.
- E Spikelets covered with fine purplish silvery hairs, stalks slender and with a few long fine hairs at the tip; each spikelet with 2 florets, the lower sterile, the upper bisexual; the upper empty glume and the lower flowering glume with awns.

Habitat: Widespread on dry open situations, often in sandy soil.

Method of Control: 2 applications of 2.5 lb MSMA plus 5 lb sodium chlorate plus 1 pt surfactant in 60 gallons water at 5 weeks interval. Spot spray thereafter when necessary.



Botanical Name: *Sacciolepis indica* (Linn.) Chase

Common Name: Short-Spiked Sacciolepis

Malay Name: Rumput bidis

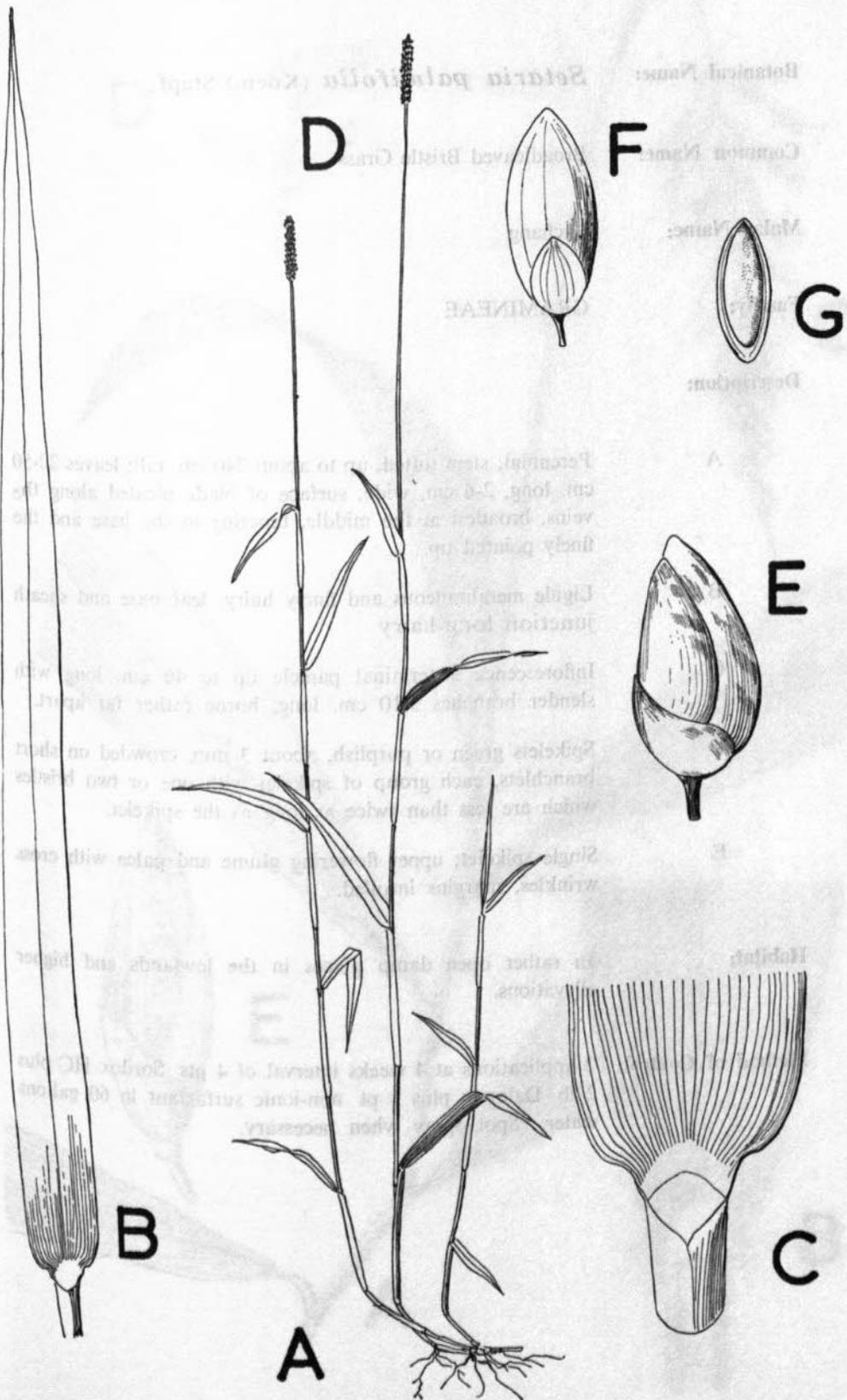
Family: GRAMINEAE

Description:

- A Annual; stem tufted, sometimes creeping, 15-30 cm. high.
- B Leaves narrow, usually 5-10 cm. long, often not hairy.
- C Ligule a ridge of short hairs leaf-blade and sheath junction hairless.
- D Inflorescence a dense short spike not more than 5 cm. long arising from end of shoots; spikelets arranged on all sides of the spike on short stalks, asymmetrical lanceolate ovoid, curved, sparsely hairy.
- E & F 2 views of a single spikelet, with 2 florets, the lower male sterile, the upper bisexual.
- G Single floret.

Habitat: Common in open grassy places, often gregarious in swampy areas.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 5 lb sodium chlorate in 40 gallons water. Spot spray thereafter when necessary.



Botanical Name: *Setaria palmifolia* (Koen.) Stapf.

Common Name: Broadleaved Bristle Grass

Malay Name: Lachang

Family: GRAMINEAE

Description:

A Perennial; stem tufted, up to about 240 cm. tall; leaves 20-50 cm. long, 2-6 cm. wide, surface of blade pleated along the veins, broadest at the middle, tapering to the base and the finely pointed tip.

B Ligule membranous and finely hairy; leaf base and sheath junction long hairy

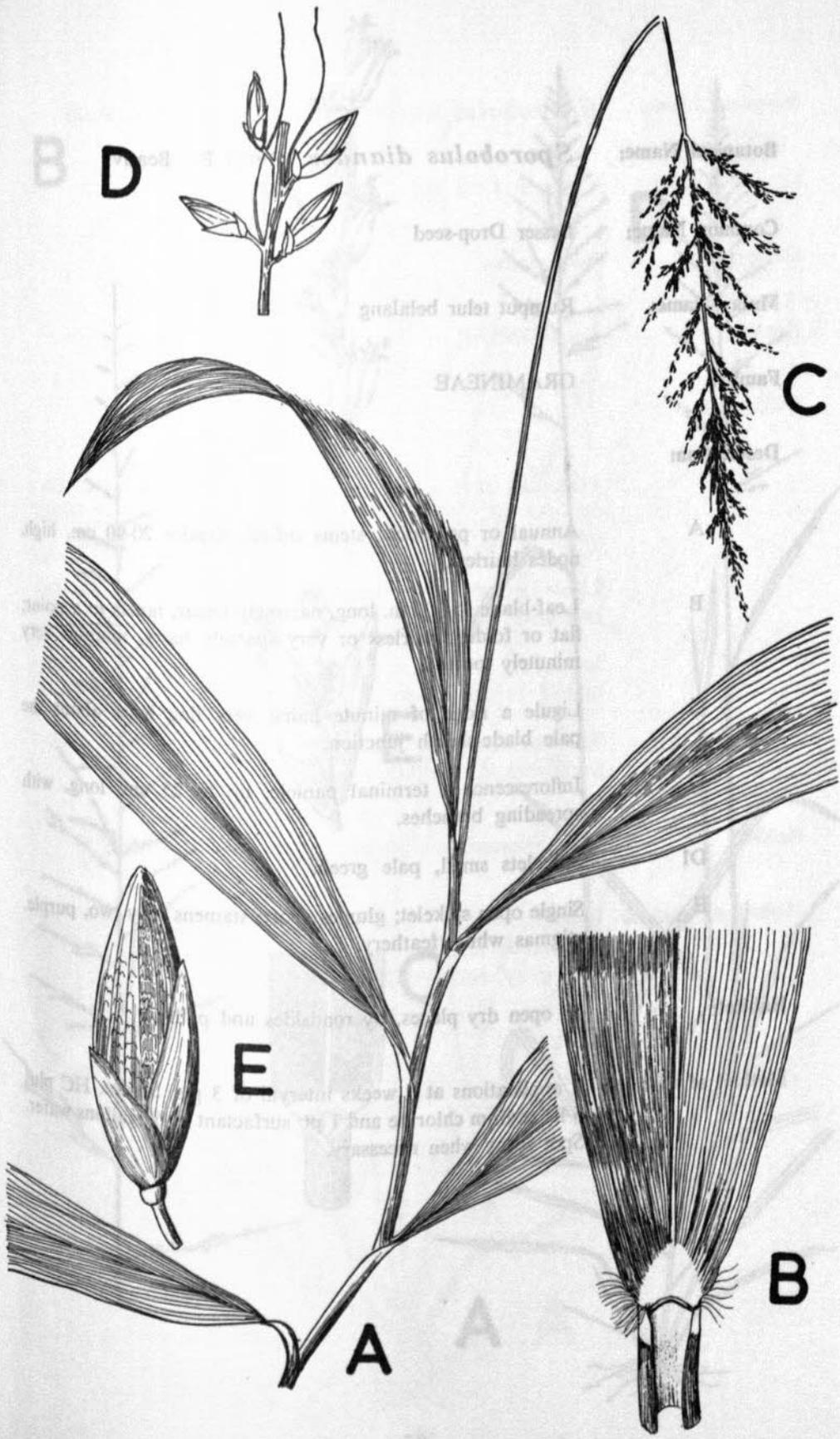
C Inflorescence a terminal panicle up to 40 cm. long with slender branches 5-10 cm. long, borne rather far apart.

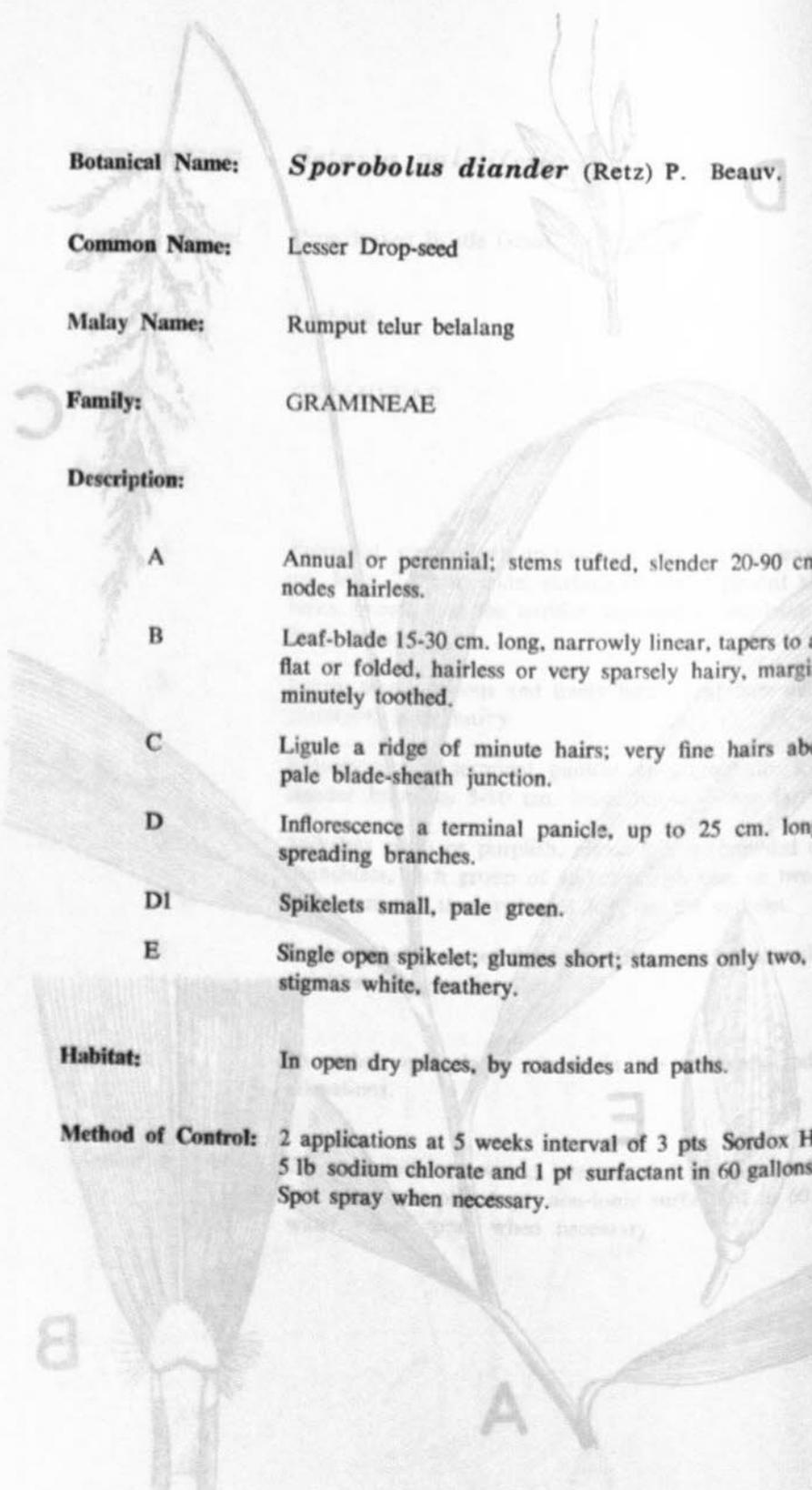
D Spikelets green or purplish, about 3 mm. crowded on short branchlets, each group of spikelet with one or two bristles which are less than twice as long as the spikelet.

E Single spikelet; upper flowering glume and palea with cross wrinkles, margins inrolled.

Habitat: In rather open damp places in the lowlands and higher elevations.

Method of Control: 2 applications at 4 weeks interval of 4 pts Sordox HC plus 2 lb Dalapon plus 1 pt non-ionic surfactant in 60 gallons water. Spot spray when necessary.





Botanical Name: *Sporobolus diander* (Retz) P. Beauv.

Common Name: Lesser Drop-seed

Malay Name: Rumput telur belalang

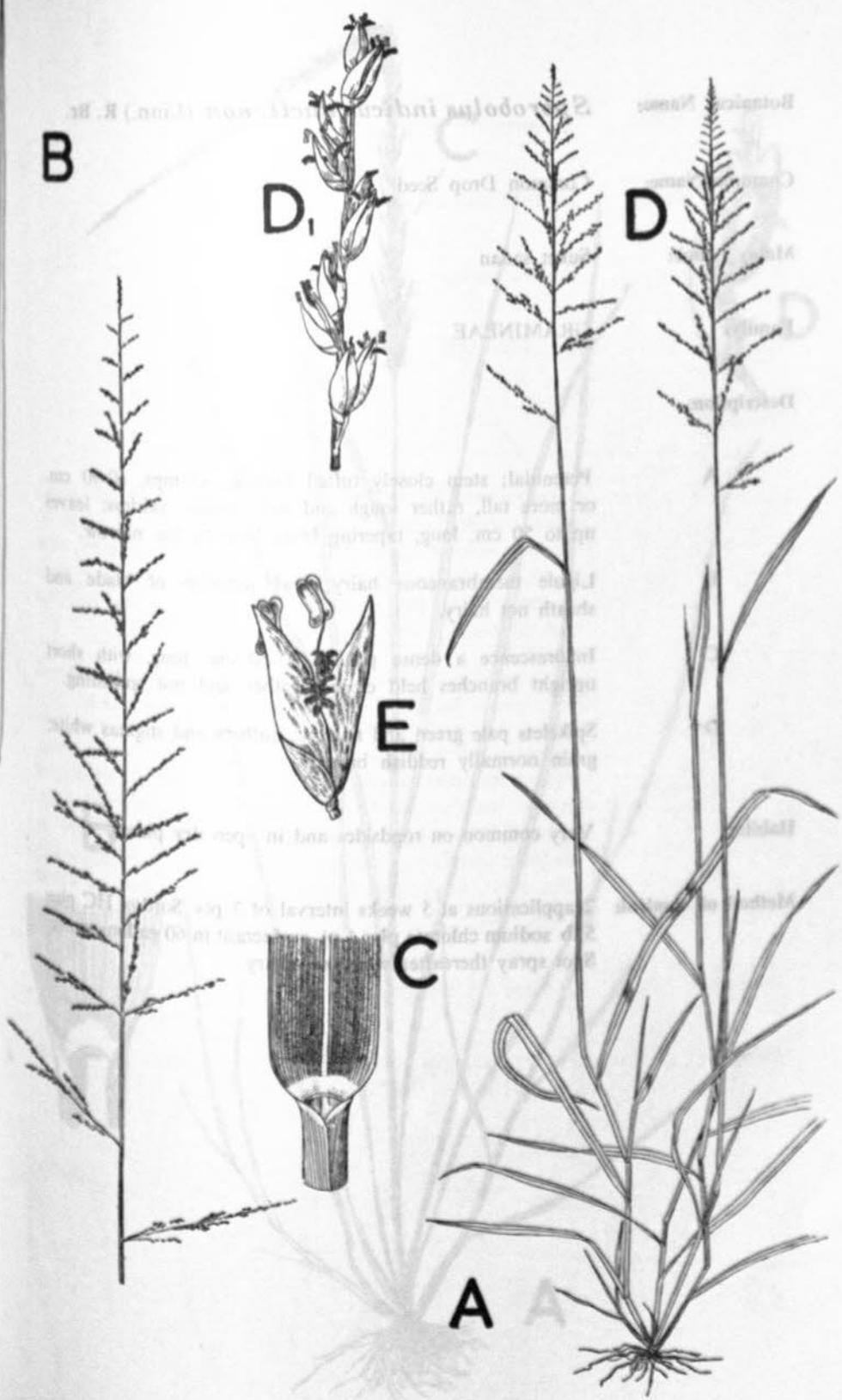
Family: GRAMINEAE

Description:

- A Annual or perennial; stems tufted, slender 20-90 cm. high, nodes hairless.
- B Leaf-blade 15-30 cm. long, narrowly linear, tapers to a point; flat or folded, hairless or very sparsely hairy, margins very minutely toothed.
- C Ligule a ridge of minute hairs; very fine hairs about the pale blade-sheath junction.
- D Inflorescence a terminal panicle, up to 25 cm. long, with spreading branches.
- D1 Spikelets small, pale green.
- E Single open spikelet; glumes short; stamens only two, purple, stigmas white, feathery.

Habitat: In open dry places, by roadsides and paths.

Method of Control: 2 applications at 5 weeks interval of 3 pts Sordox HC plus 5 lb sodium chlorate and 1 pt surfactant in 60 gallons water. Spot spray when necessary.



Botanical Name: *Sporobolus indicus auctt. non* (Linn.) R. Br.

Common Name: Common Drop Seed

Malay Name: Suket sadan

Family: GRAMINEAE

Description:

A Perennial; stem closely tufted forming clumps, 60-90 cm. or more tall, rather tough and wiry; nodes hairless; leaves up to 50 cm. long, tapering from base to tip, narrow.

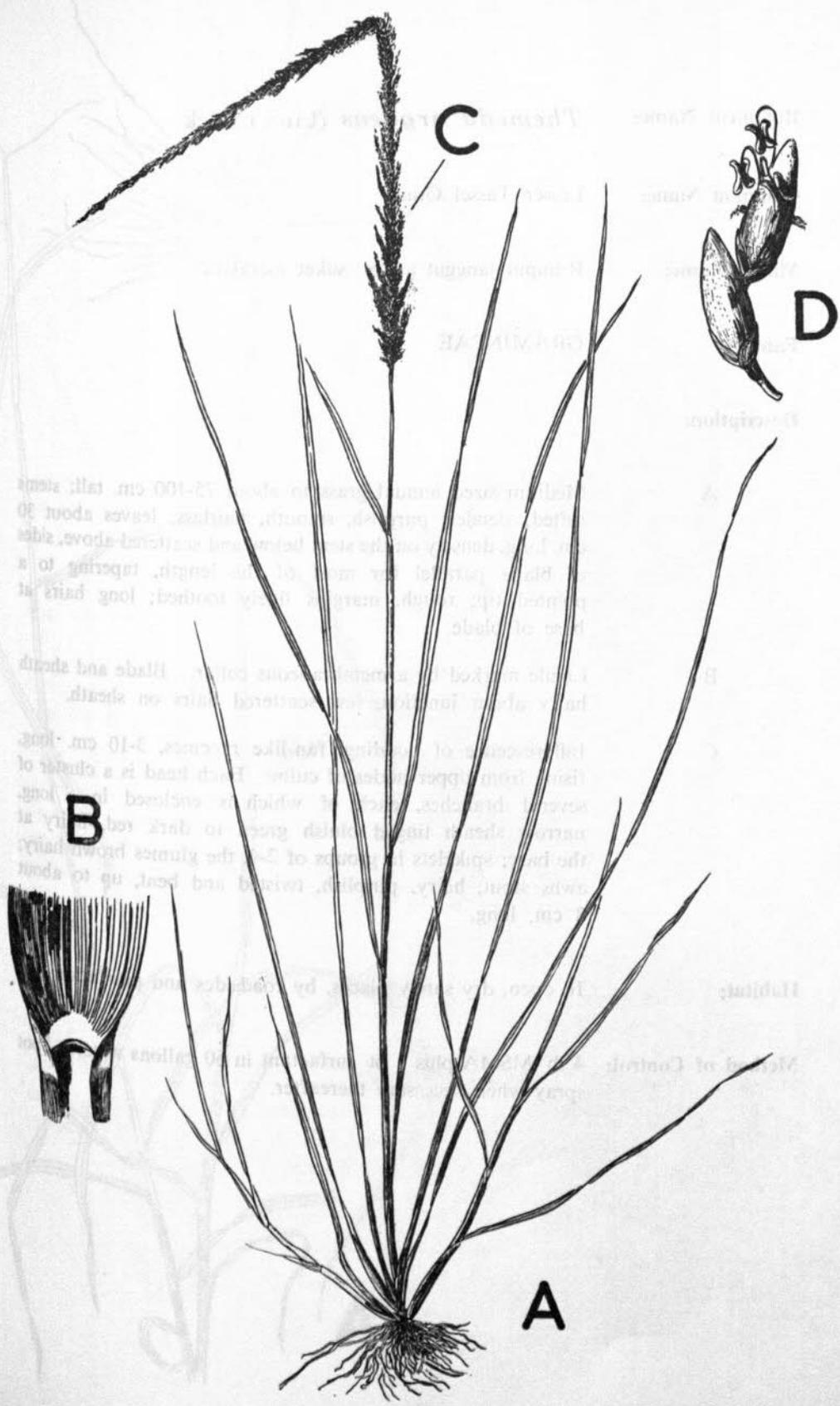
B Ligule membranous hairy; leaf junction of blade and sheath not hairy.

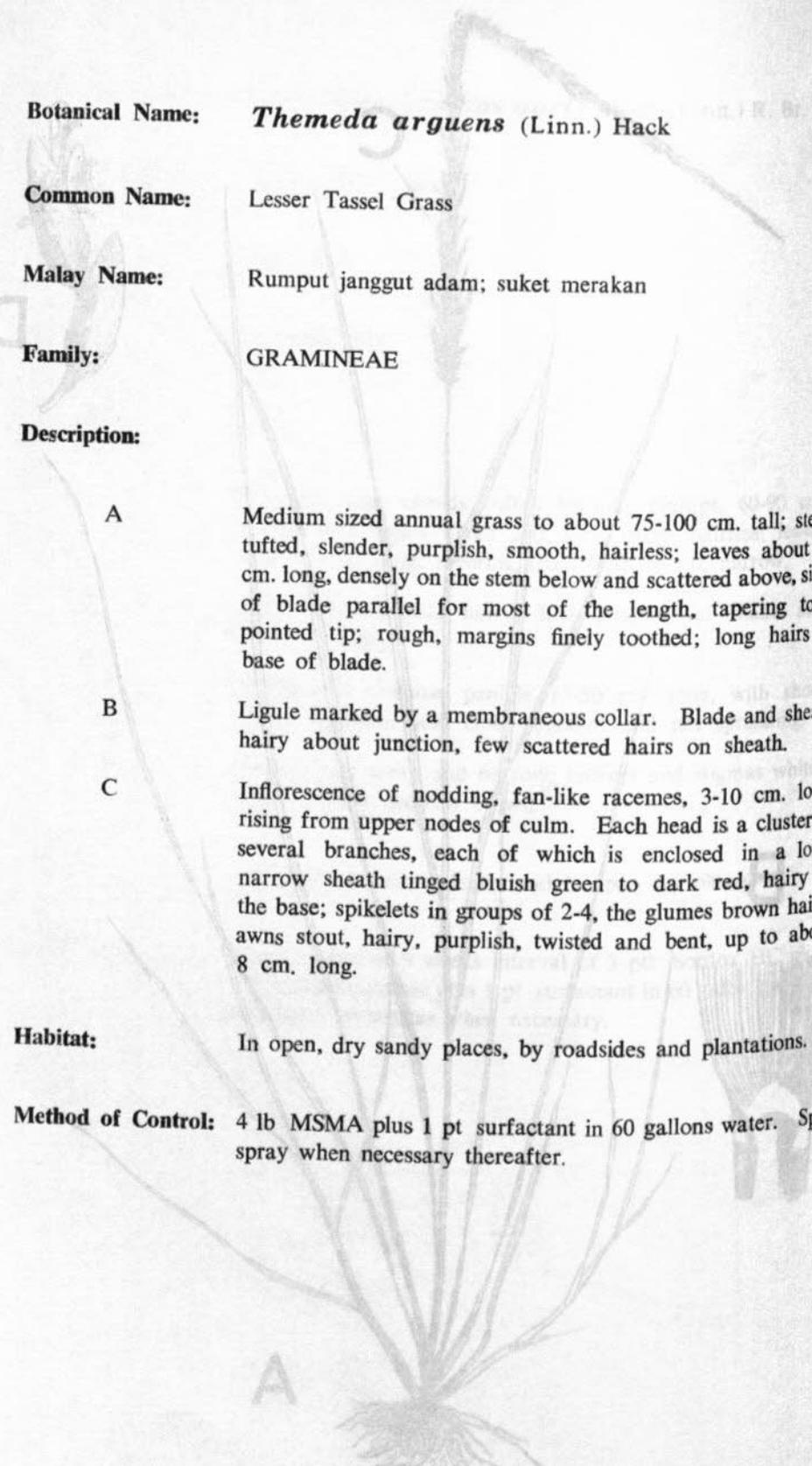
C Inflorescence a dense panicle 15-50 cm. long, with short upright branches held close together and not spreading.

D Spikelets pale green and narrow; anthers and stigmas white; grain normally reddish brown.

Habitat: Very common on roadsides and in open dry places.

Method of Control: 2 applications at 5 weeks interval of 3 pts Sordox HC plus 5 lb sodium chlorate plus 1 pt surfactant in 60 gallons water. Spot spray thereafter when necessary.





Botanical Name: *Themeda arguens* (Linn.) Hack

Common Name: Lesser Tassel Grass

Malay Name: Rumpit janggut adam; sukut merakan

Family: GRAMINEAE

Description:

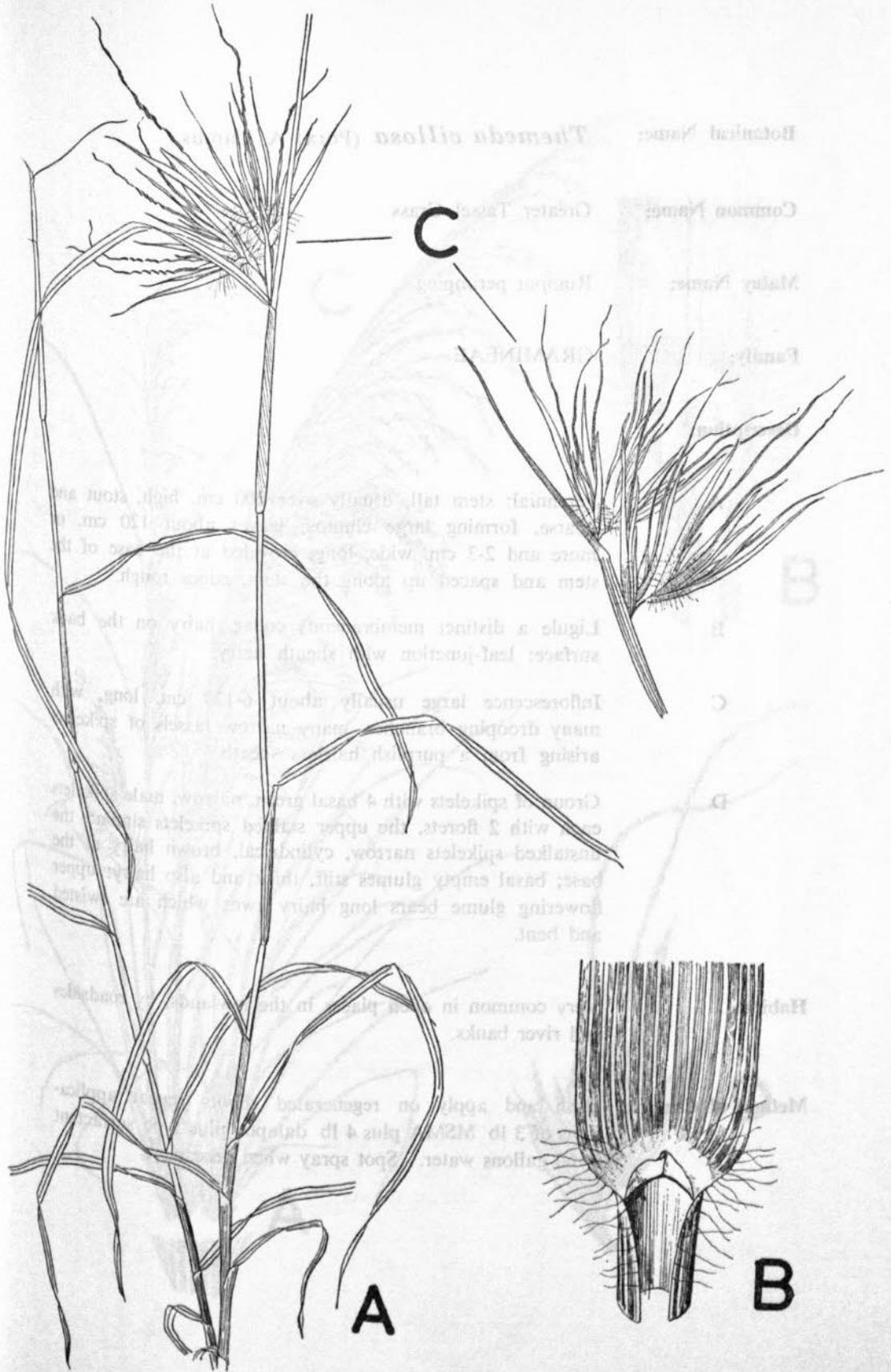
A Medium sized annual grass to about 75-100 cm. tall; stems tufted, slender, purplish, smooth, hairless; leaves about 30 cm. long, densely on the stem below and scattered above, sides of blade parallel for most of the length, tapering to a pointed tip; rough, margins finely toothed; long hairs at base of blade.

B Ligule marked by a membraneous collar. Blade and sheath hairy about junction, few scattered hairs on sheath.

C Inflorescence of nodding, fan-like racemes, 3-10 cm. long, rising from upper nodes of culm. Each head is a cluster of several branches, each of which is enclosed in a long, narrow sheath tinged bluish green to dark red, hairy at the base; spikelets in groups of 2-4, the glumes brown hairy; awns stout, hairy, purplish, twisted and bent, up to about 8 cm. long.

Habitat: In open, dry sandy places, by roadsides and plantations.

Method of Control: 4 lb MSMA plus 1 pt surfactant in 60 gallons water. Spot spray when necessary thereafter.



Botanical Name: *Themeda villosa* (Poix) A. Camus

Common Name: Greater Tassel Grass

Malay Name: Rumput perimping

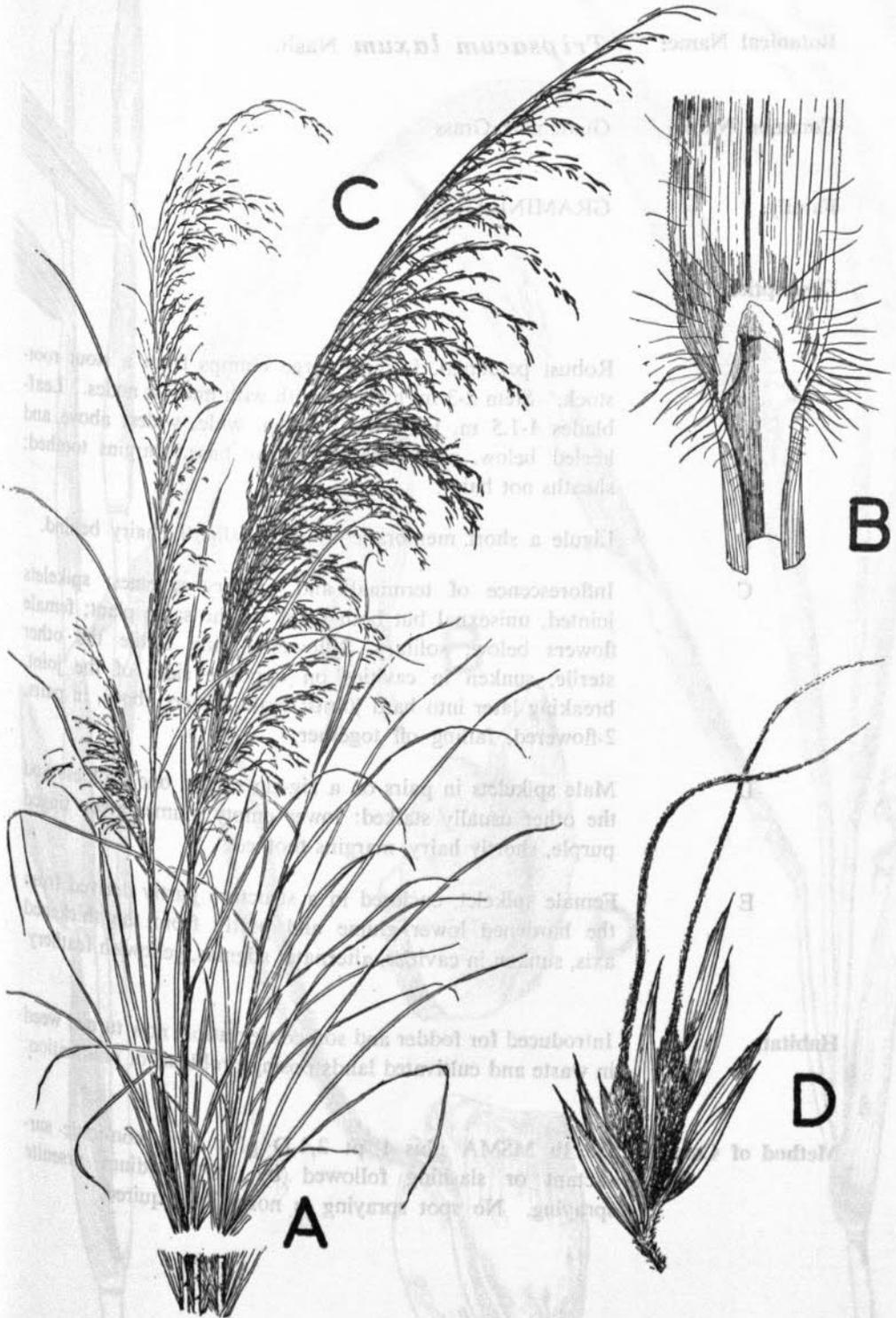
Family: GRAMINEAE

Description:

- A Perennial; stem tall, usually over 200 cm. high, stout and coarse, forming large clumps; leaves about 120 cm. or more and 2-3 cm. wide, long, crowded at the base of the stem and spaced up along the stem, edges rough.
- B Ligule a distinct membranous collar, hairy on the back surface; leaf-junction with sheath hairy.
- C Inflorescence large usually about 6-120 cm. long, with many drooping branches, many narrow tassels of spikelets arising from a purplish hairless sheath
- D Group of spikelets with 4 basal green, narrow, male spikelets each with 2 florets, the upper stalked spikelets similar, the unstalked spikelets narrow, cylindrical, brown hairy at the base; basal empty glumes stiff, thick and also hairy; upper flowering glume bears long hairy awns which are twisted and bent.

Habitat: Very common in open places in the lowlands, by roadsides and river banks.

Method of Control: Slash and apply on regenerated shoots repeat applications of 3 lb MSMA plus 4 lb dalapon plus 1 pt surfactant in 60 gallons water. Spot spray when necessary.



Botanical Name: *Tripsacum laxum* Nash.

Common Name: Guatemala Grass

Family: GRAMINEAE

Description:

A Robust perennial, forming large clumps from a stout root-stock. Stem 2-3 m. high, smooth with hairless nodes. Leaf-blades 1-1.5 m. long and 5-9 cm. wide, widest above and keeled below, not narrowed at the base, margins toothed; sheaths not hairy.

B Ligule a short membraneous ridge, slightly hairy behind.

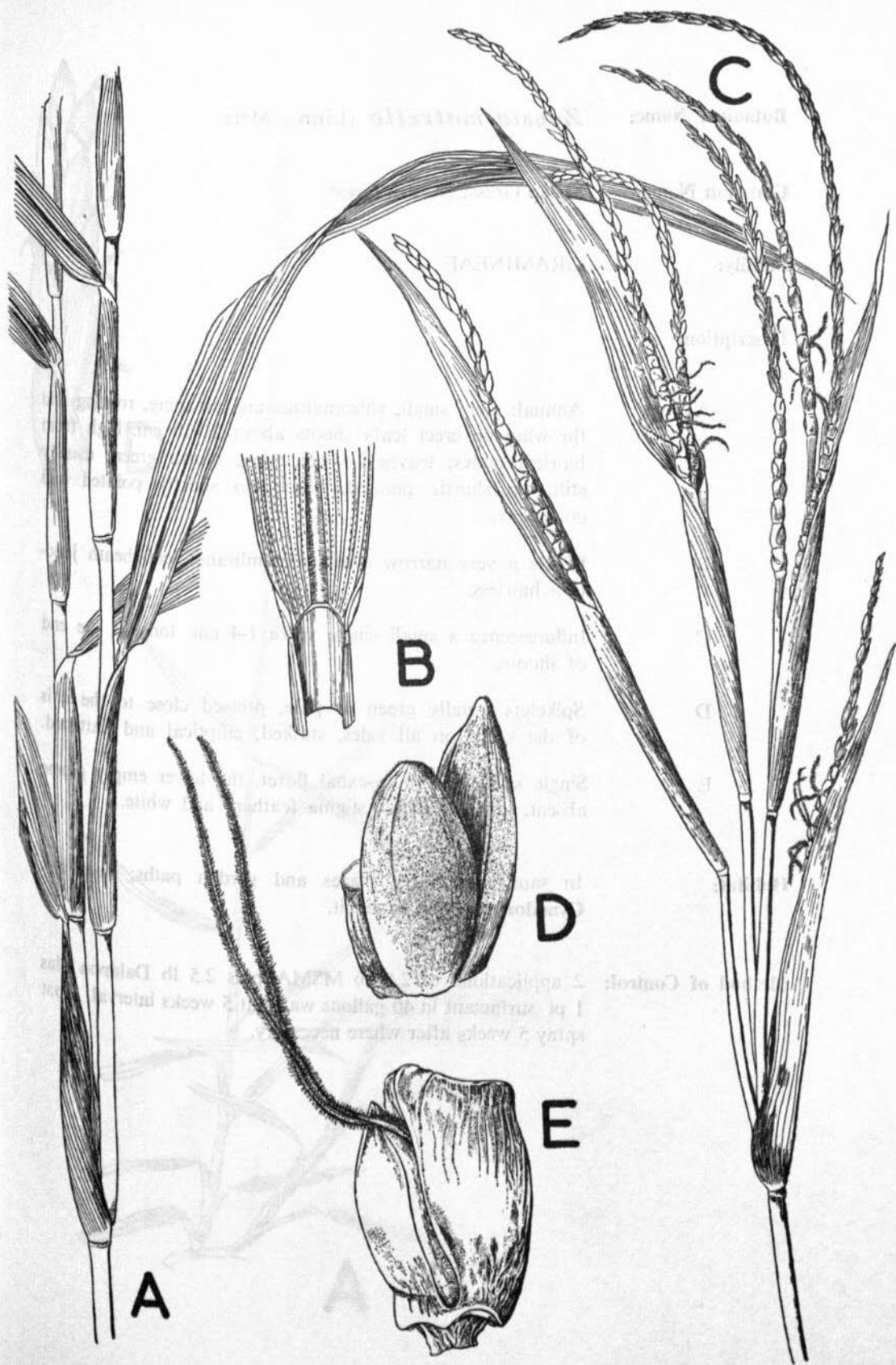
C Inflorescence of terminal and axillary racemes; spikelets jointed, unisexual but both sexes on the same plant; female flowers below, solitary, 2-flowered, one fertile the other sterile, sunken in cavities on opposite sides of the joint, breaking later into hard joints; male flowers above, in pairs, 2-flowered, falling off together.

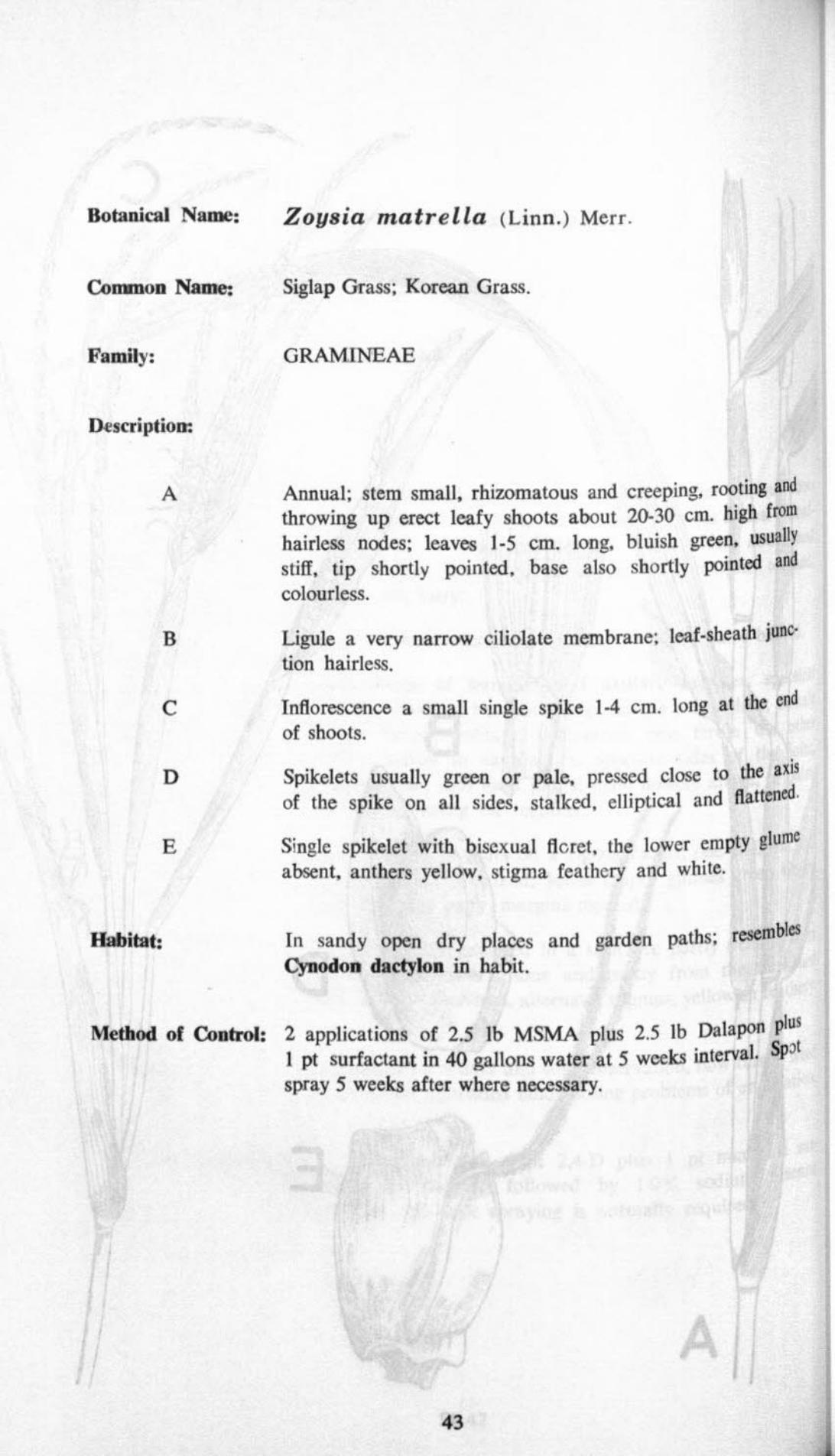
D Male spikelets in pairs on a zig-zig rachis, one stalkless and the other usually stalked; lower empty glumes green tinged purple, shortly hairy, margins toothed.

E Female spikelet, enclosed in a structure partly derived from the hardened lower glume and partly from the thickened axis, sunken in cavities, alternate; stigmas, yellowish feathery.

Habitat: Introduced for fodder and soil conservation, now turned weed in waste and cultivated lands posing problems of eradication.

Method of Control: 2.5 lb MSMA plus 1 pt 2,4-D plus 1 pt non-ionic surfactant or slashing followed by 1.0% sodium arsenite spraying. No spot spraying is normally required.





Botanical Name: *Zoysia matrella* (Linn.) Merr.

Common Name: Siglap Grass; Korean Grass.

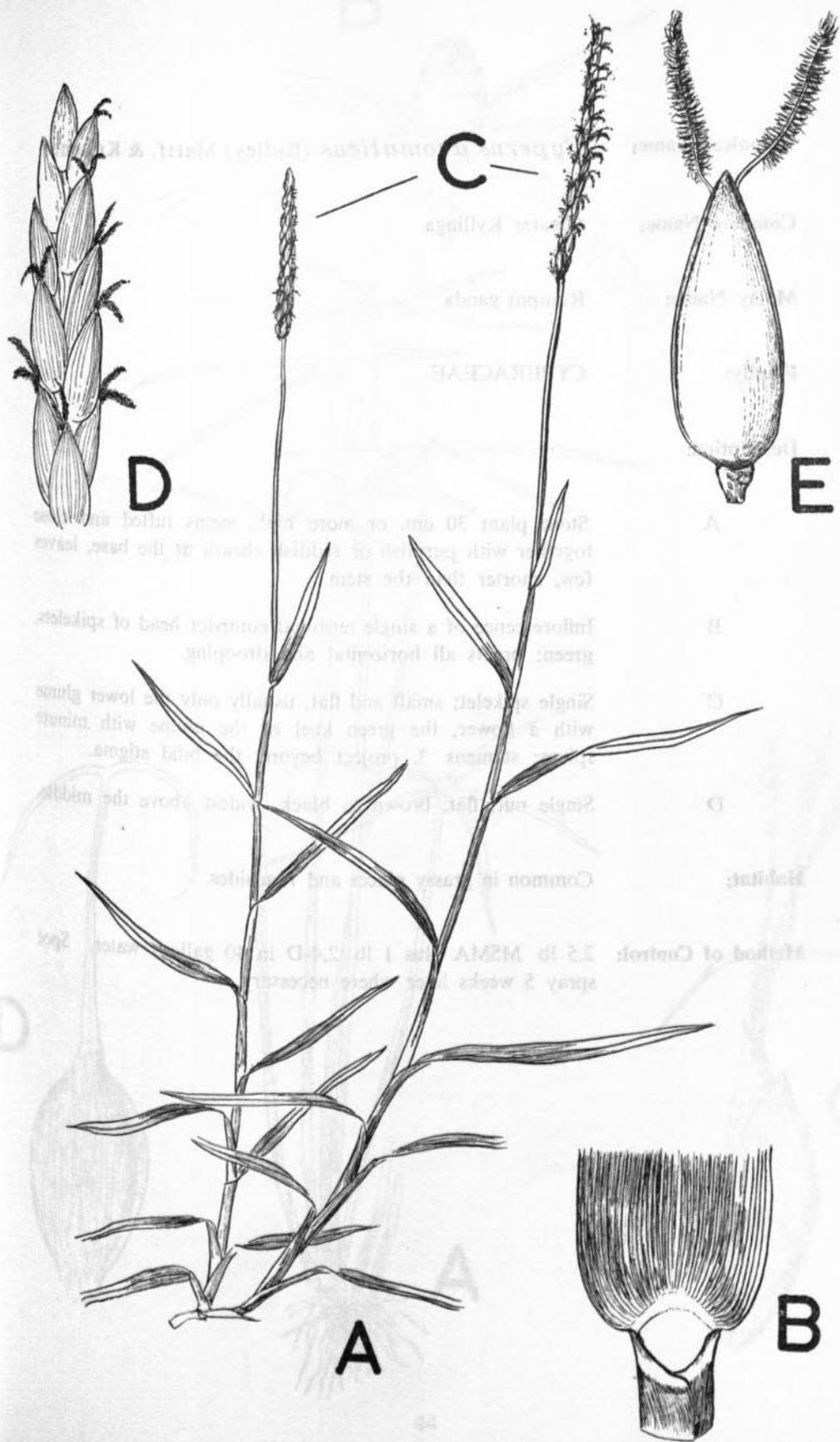
Family: GRAMINEAE

Description:

- A Annual; stem small, rhizomatous and creeping, rooting and throwing up erect leafy shoots about 20-30 cm. high from hairless nodes; leaves 1-5 cm. long, bluish green, usually stiff, tip shortly pointed, base also shortly pointed and colourless.
- B Ligule a very narrow ciliate membrane; leaf-sheath junction hairless.
- C Inflorescence a small single spike 1-4 cm. long at the end of shoots.
- D Spikelets usually green or pale, pressed close to the axis of the spike on all sides, stalked, elliptical and flattened.
- E Single spikelet with bisexual floret, the lower empty glume absent, anthers yellow, stigma feathery and white.

Habitat: In sandy open dry places and garden paths; resembles *Cynodon dactylon* in habit.

Method of Control: 2 applications of 2.5 lb MSMA plus 2.5 lb Dalapon plus 1 pt surfactant in 40 gallons water at 5 weeks interval. Spot spray 5 weeks after where necessary.



Botanical Name: *Cyperus aromaticus* (Ridley) Mattf. & Kukenth

Common Name: Greater Kyllinga

Malay Name: Rumput ganda

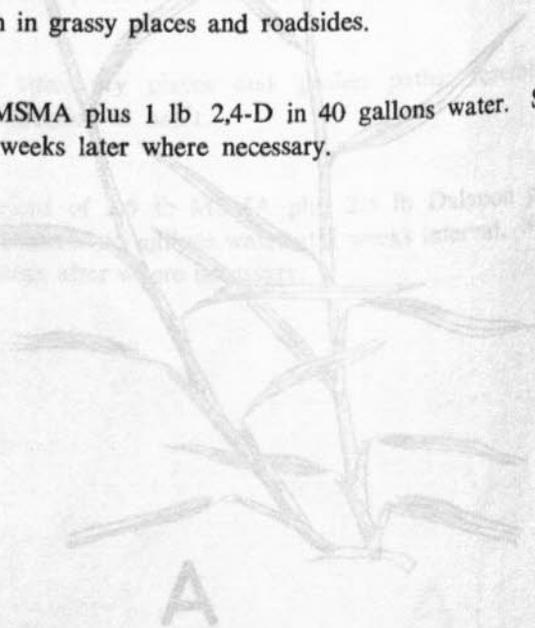
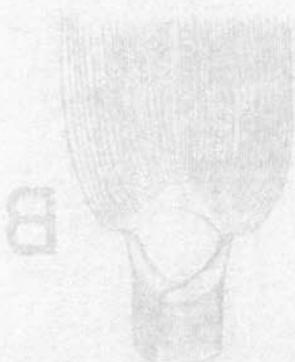
Family: CYPERACEAE

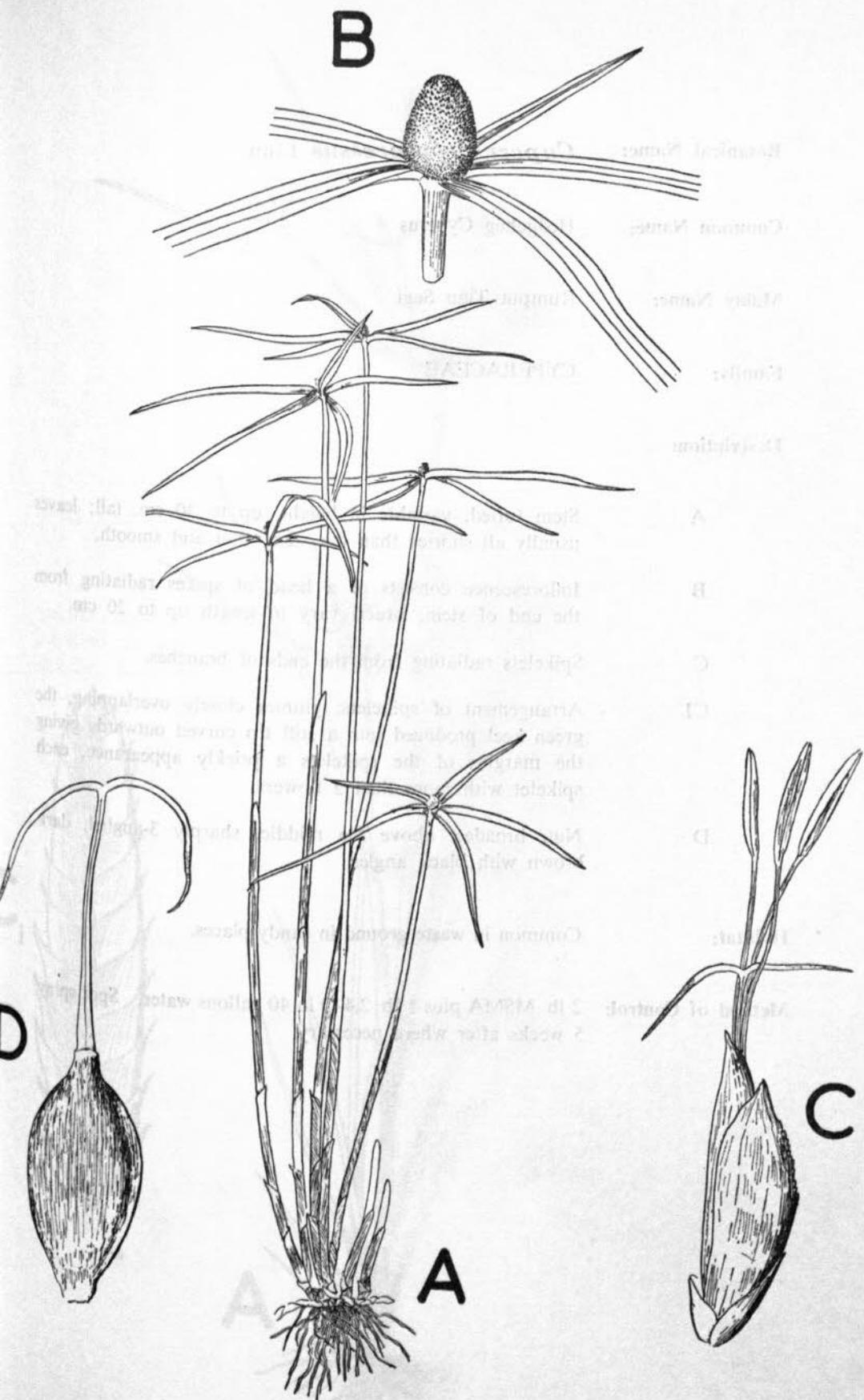
Description:

- A Stout plant 30 cm. or more high, stems tufted and close together with purplish or reddish sheath at the base, leaves few, shorter than the stem.
- B Inflorescence of a single terminal compact head of spikelets, green; bracts all horizontal and drooping.
- C Single spikelet; small and flat, usually only the lower glume with a flower, the green keel of the glume with minute spines; stamens 3, project beyond the bifid stigma.
- D Single nut; flat, brown to black, widest above the middle.

Habitat: Common in grassy places and roadsides.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks later where necessary.





Botanical Name: *Cyperus compressus* Linn.

Common Name: Hedgehog Cyperus

Malay Name: Rumput Tigu Segi

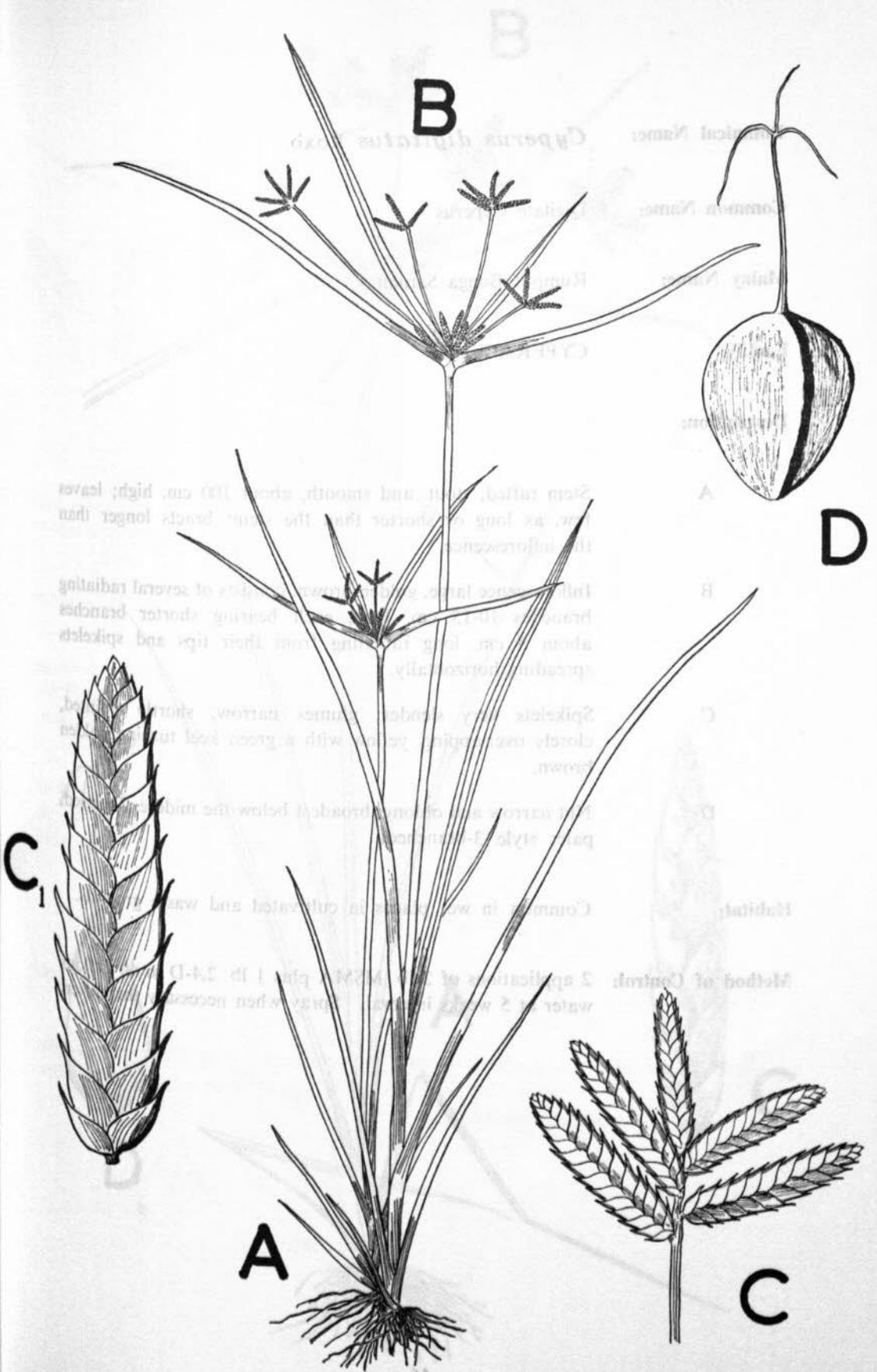
Family: CYPERACEAE

Description:

- A Stem tufted, variable in height, up to 30 cm. tall; leaves usually all shorter than the stem, thin and smooth.
- B Inflorescence consists of a head of spikes radiating from the end of stem; bracts vary in length up to 20 cm.
- C Spikelets radiating from the ends of branches.
- C1 Arrangement of spikelets; glumes closely overlapping, the green keel produced into a stiff tip curved outwards giving the margins of the spikelets a prickly appearance, each spikelet with more than 2 flowers.
- D Nut, broadest above the middle, sharply 3-angled, dark brown with black angles.

Habitat: Common in waste ground in sandy places.

Method of Control: 2 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks after where necessary.



Botanical Name: *Cyperus digitatus* Roxb.

Common Name: Digitate Cyperus

Malay Name: Rumput Bunga Satuan

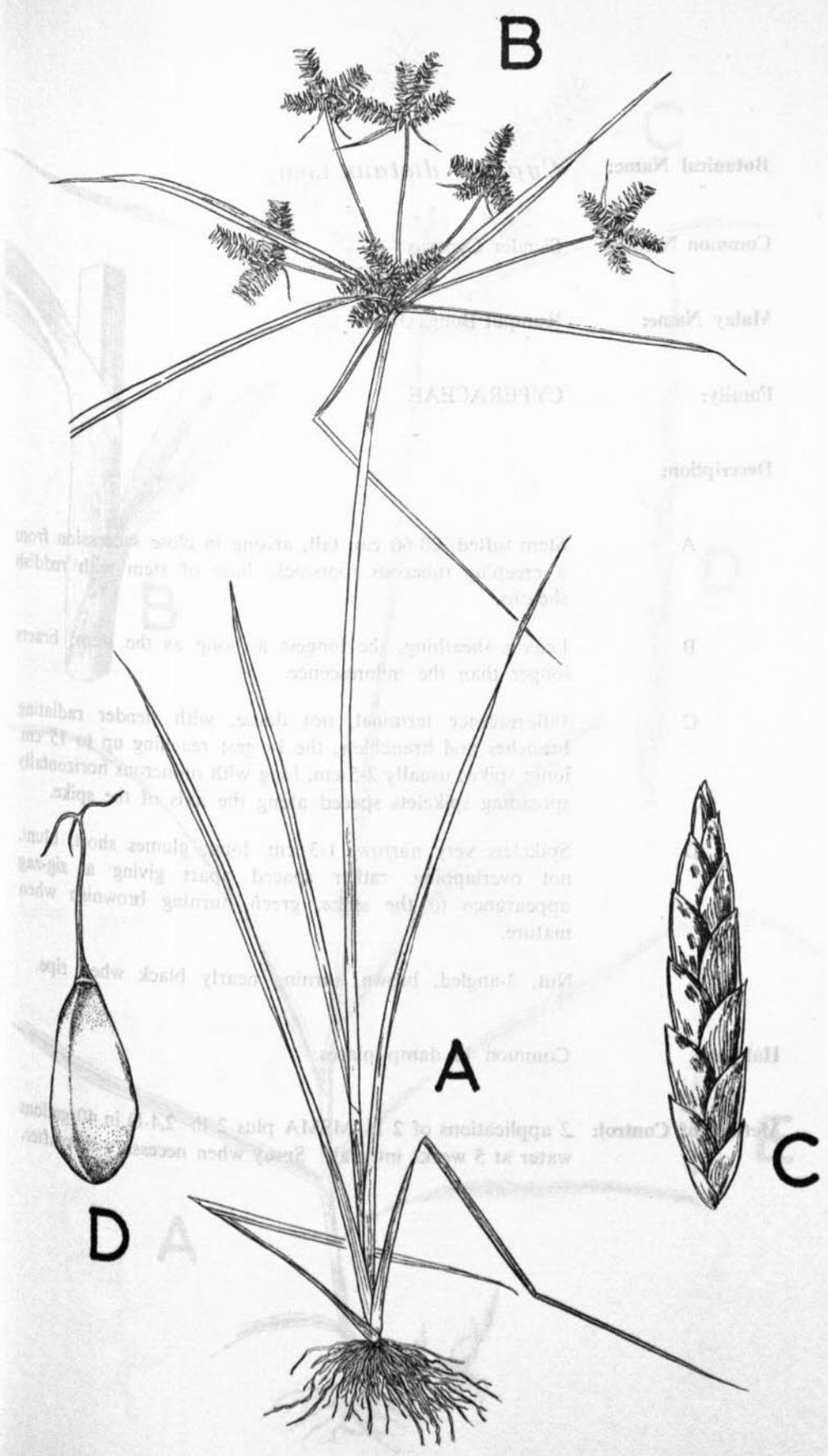
Family: CYPERACEAE

Description:

- A Stem tufted, stout and smooth, about 100 cm. high; leaves few, as long or shorter than the stem; bracts longer than the inflorescence.
- B Inflorescence large, golden brown, consists of several radiating branches 10-15 cm. long, each bearing shorter branches about 5 cm. long radiating from their tips and spikelets spreading horizontally.
- C Spikelets very slender; glumes narrow, shortly pointed, closely overlapping, yellow with a green keel turning golden brown.
- D Nut narrow and oblong, broadest below the middle, 3-angled, pale; style 3-branched.

Habitat: Common in wet places in cultivated and waste grounds.

Method of Control: 2 applications of 2 lb MSMA plus 1 lb 2,4-D in 40 gallons water at 5 weeks interval. Spray when necessary thereafter.



Botanical Name: *Cyperus distans* Linn.

Common Name: Slender Cyperus

Malay Name: Rumput Bunga Jauh

Family: CYPERACEAE

Description:

A Stem tufted, 20-60 cm. tall, arising in close succession from a creeping tuberous rootstock, base of stem with reddish sheaths.

B Leaves sheathing, the longest as long as the stem; bracts longer than the inflorescence.

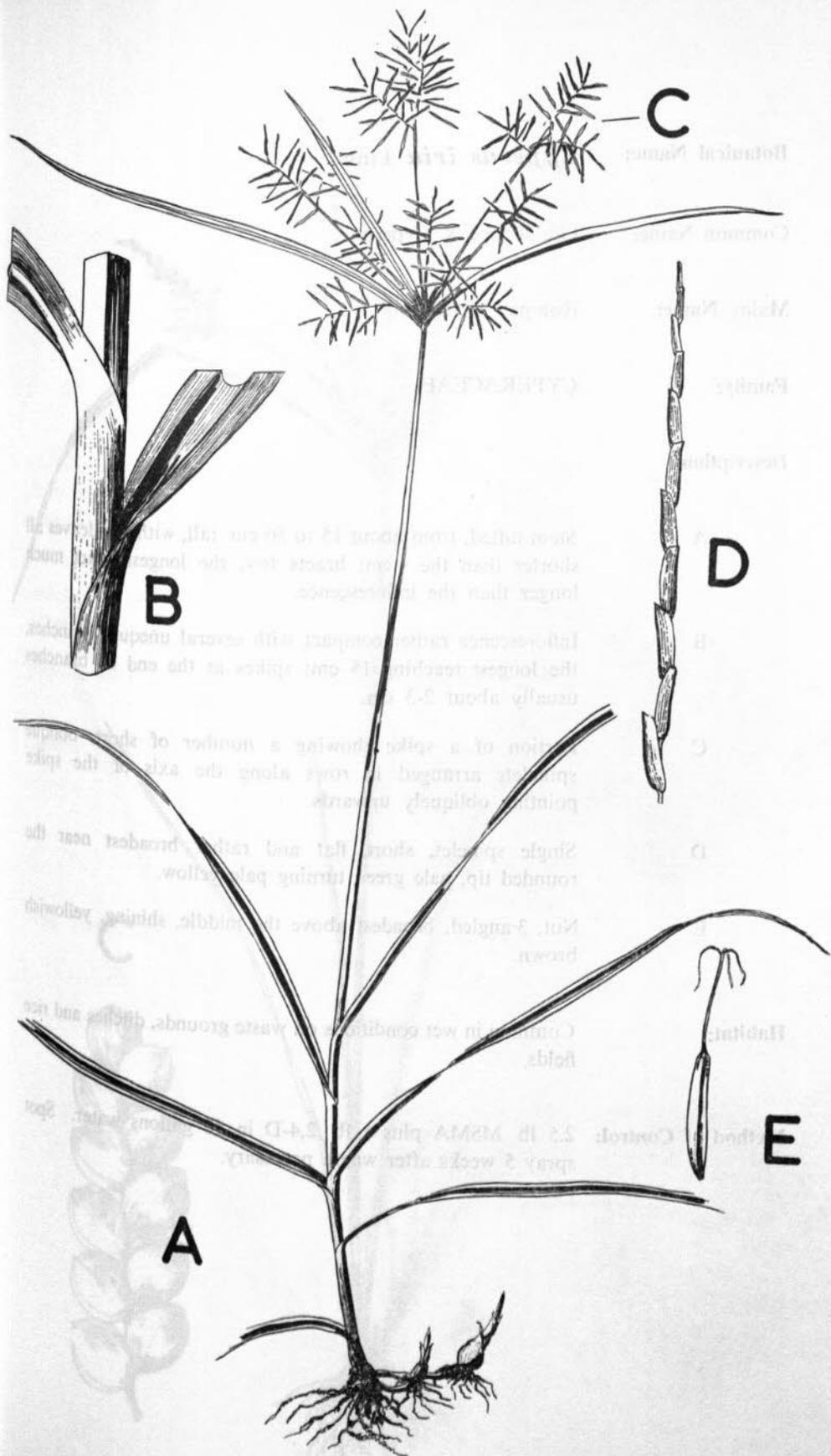
C Inflorescence terminal, not dense, with slender radiating branches and branchlets, the longest reaching up to 15 cm. long; spikes usually 2-5 cm. long with numerous horizontally spreading spikelets spaced along the axis of the spike.

D Spikelets very narrow, 1-3 cm. long; glumes short, blunt, not overlapping, rather spaced apart giving a zig-zag appearance to the spike, green, turning brownish when mature.

E Nut, 3-angled, brown, turning nearly black when ripe.

Habitat: Common in damp places

Method of Control: 2 applications of 2 lb MSMA plus 2 lb 2,4-D in 40 gallons water at 5 weeks interval. Spray when necessary thereafter.



Botanical Name: *Cyperus iria* Linn.

Common Name: Grasshopper's Cyperus

Malay Name: Rumput Menderong

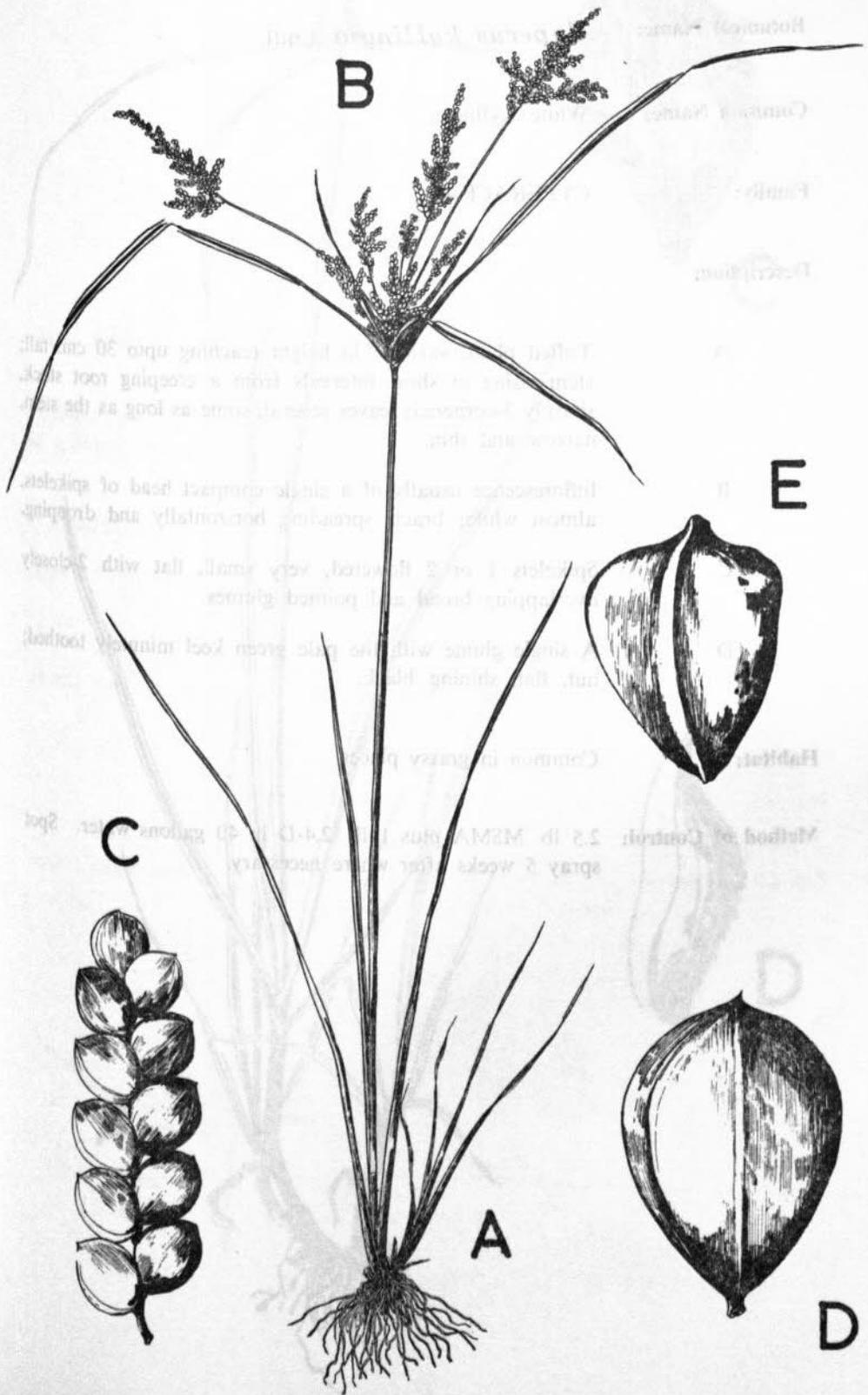
Family: CYPERACEAE

Description:

- A Stem tufted, from about 15 to 50 cm. tall, with few leaves all shorter than the stem; bracts few, the longest bract much longer than the inflorescence.
- B Inflorescence rather compact with several unequal branches, the longest reaching 15 cm; spikes at the end of branches usually about 2-3 cm.
- C Portion of a spike showing a number of short, oblique spikelets arranged in rows along the axis of the spike pointing obliquely upwards.
- D Single spikelet, short, flat and rather broadest near the rounded tip, pale green turning pale yellow.
- E Nut, 3-angled, broadest above the middle, shining, yellowish brown.

Habitat: Common in wet conditions on waste grounds, ditches and rice fields.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks after where necessary.



Botanical Name: *Cyperus kyllingia* Endl.

Common Name: White Kyllingia

Family: CYPERACEAE

Description:

A Tufted plant, variable in height reaching up to 30 cm. tall; stem rising at short intervals from a creeping root stock, sharply 3-cornered; leaves several, some as long as the stem, narrow and thin.

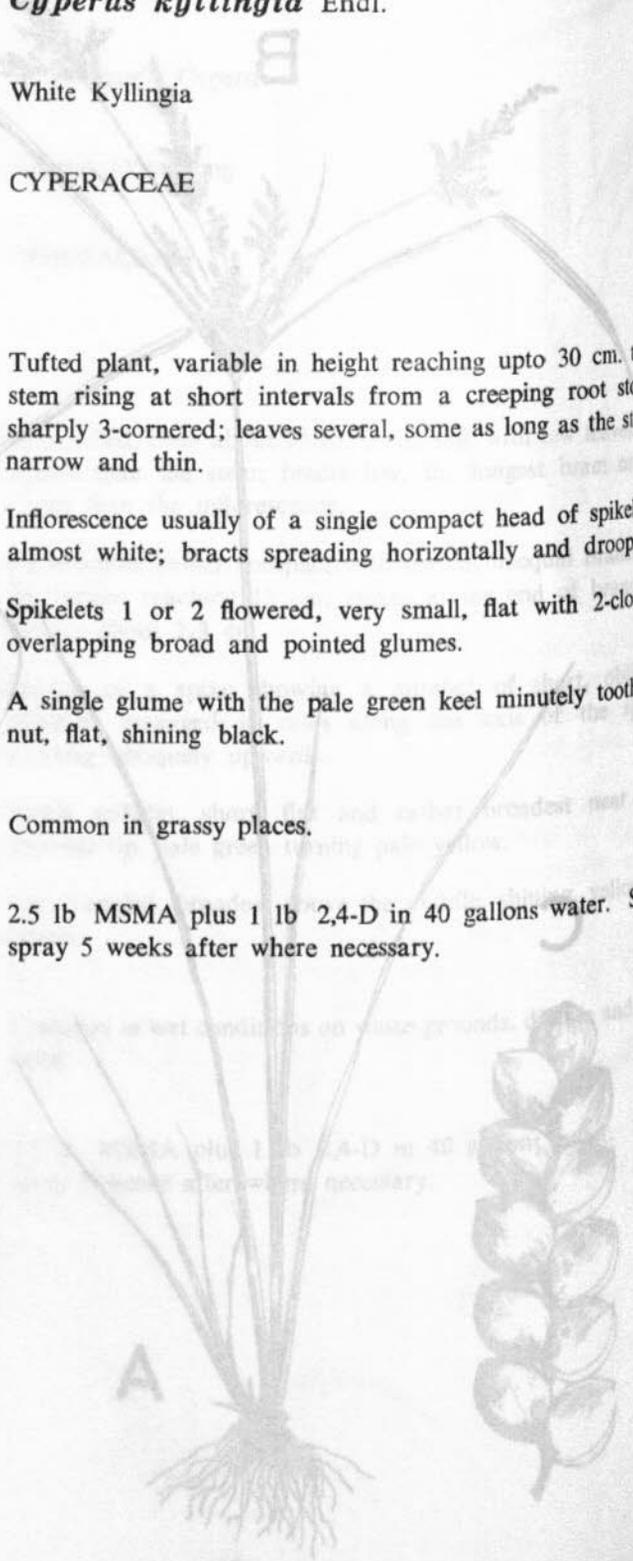
B Inflorescence usually of a single compact head of spikelets, almost white; bracts spreading horizontally and drooping.

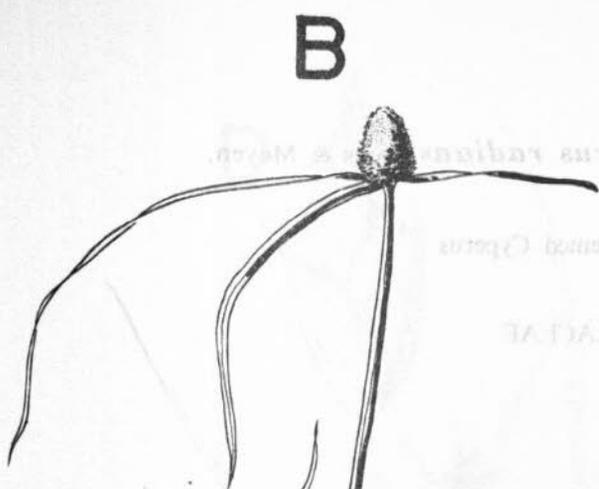
C Spikelets 1 or 2 flowered, very small, flat with 2-closely overlapping broad and pointed glumes.

D A single glume with the pale green keel minutely toothed; nut, flat, shining black.

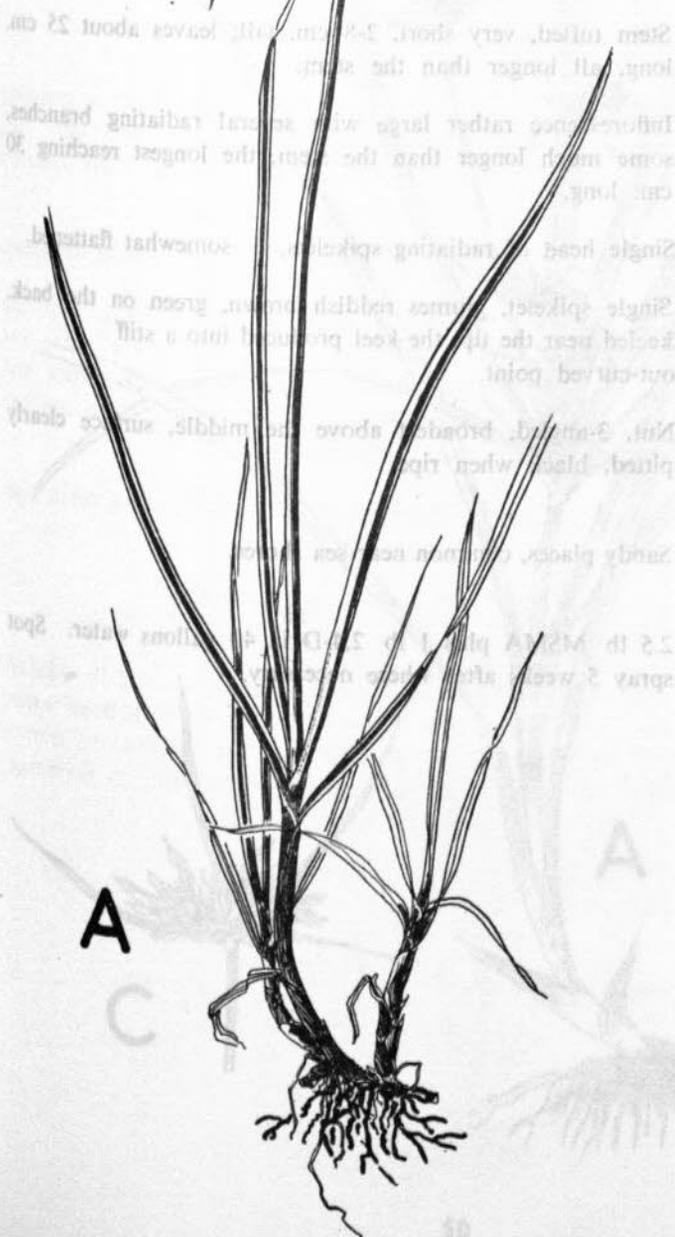
Habitat: Common in grassy places.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks after where necessary.





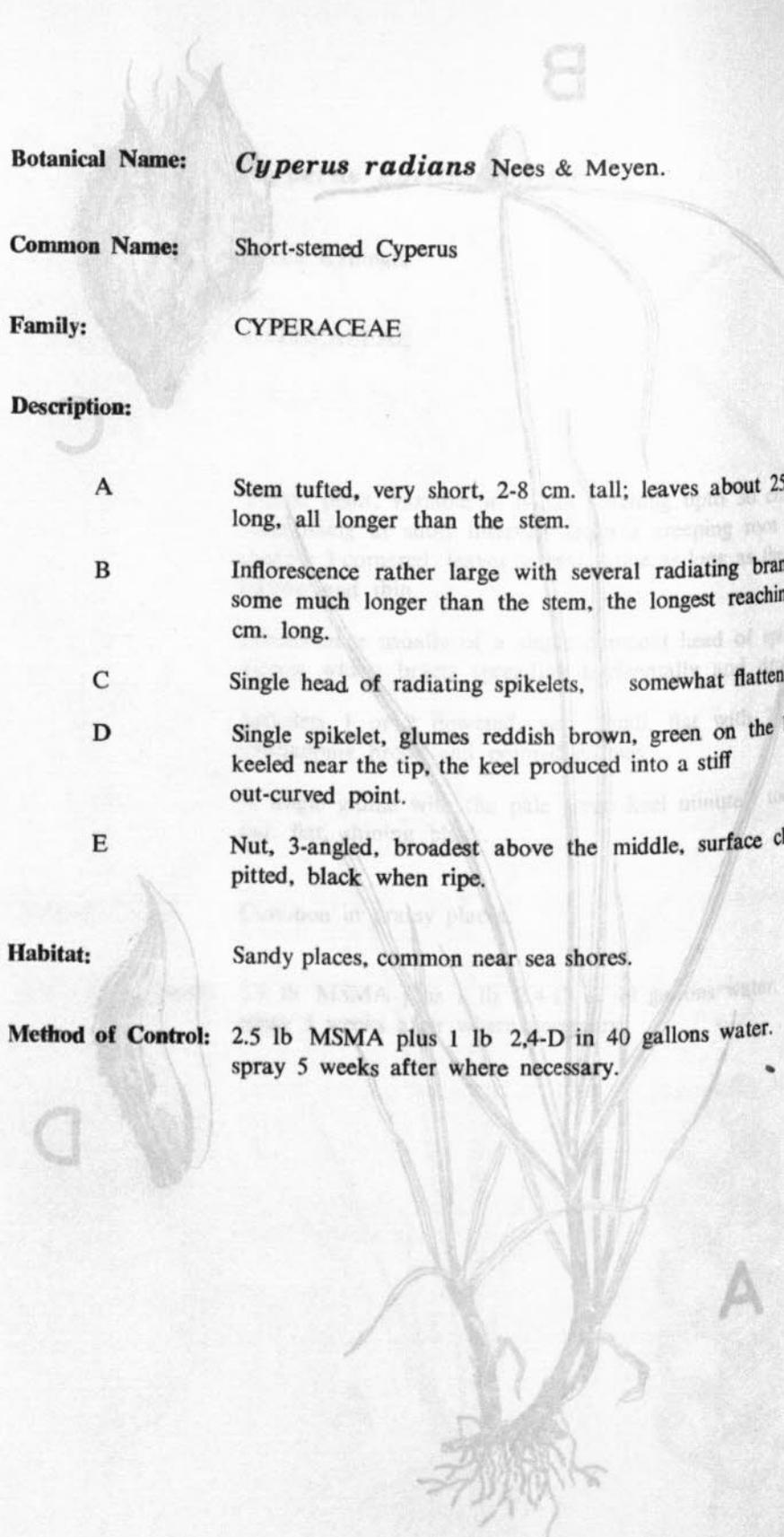
C



A



D



Botanical Name: *Cyperus radians* Nees & Meyen.

Common Name: Short-stemmed Cyperus

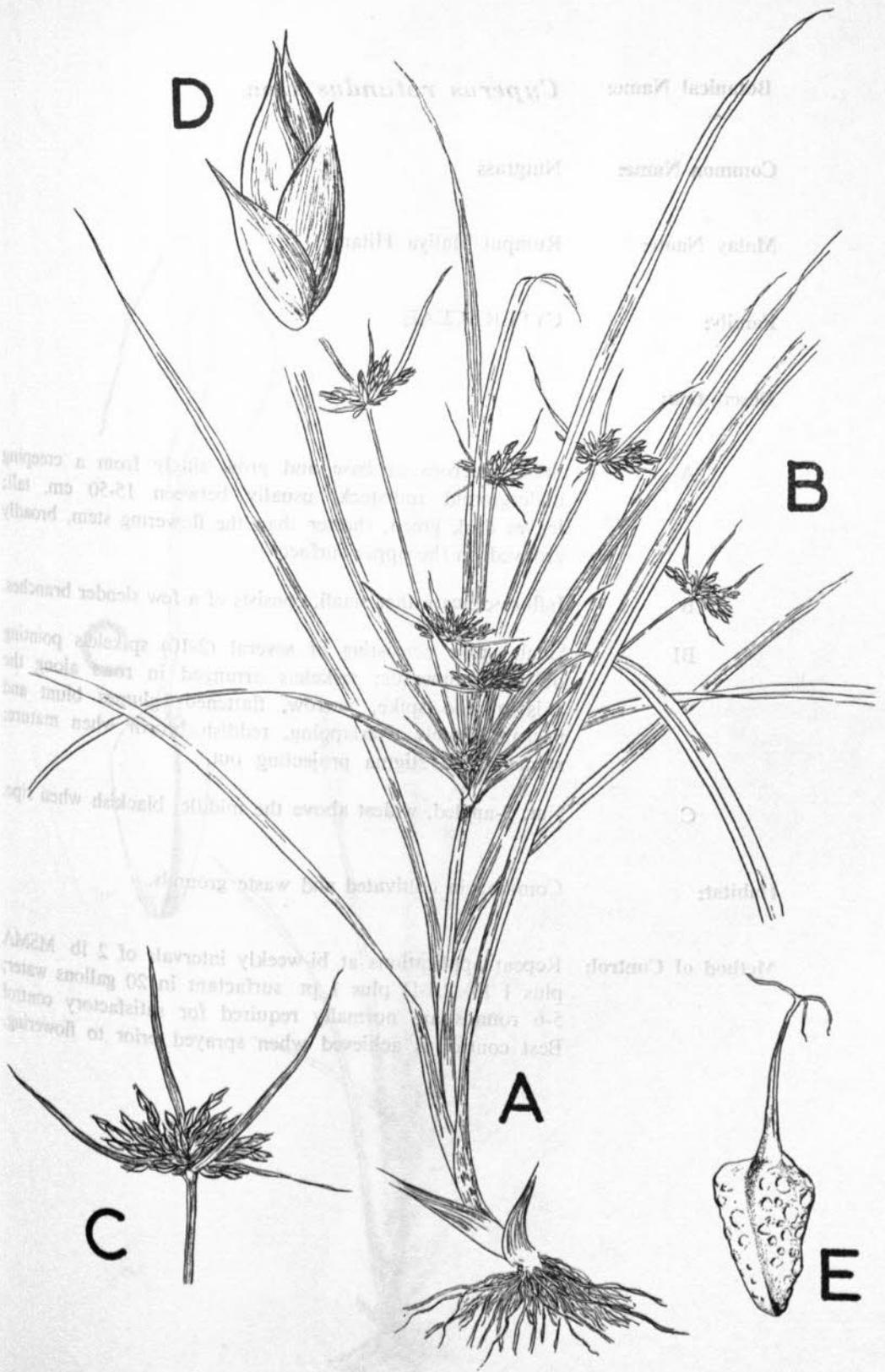
Family: CYPERACEAE

Description:

- A Stem tufted, very short, 2-8 cm. tall; leaves about 25 cm. long, all longer than the stem.
- B Inflorescence rather large with several radiating branches, some much longer than the stem, the longest reaching 30 cm. long.
- C Single head of radiating spikelets, somewhat flattened.
- D Single spikelet, glumes reddish brown, green on the back, keeled near the tip, the keel produced into a stiff out-curved point.
- E Nut, 3-angled, broadest above the middle, surface clearly pitted, black when ripe.

Habitat: Sandy places, common near sea shores.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks after where necessary.



Botanical Name: *Cyperus rotundus* Linn.

Common Name: Nutgrass

Malay Name: Rumput Haliya Hitam

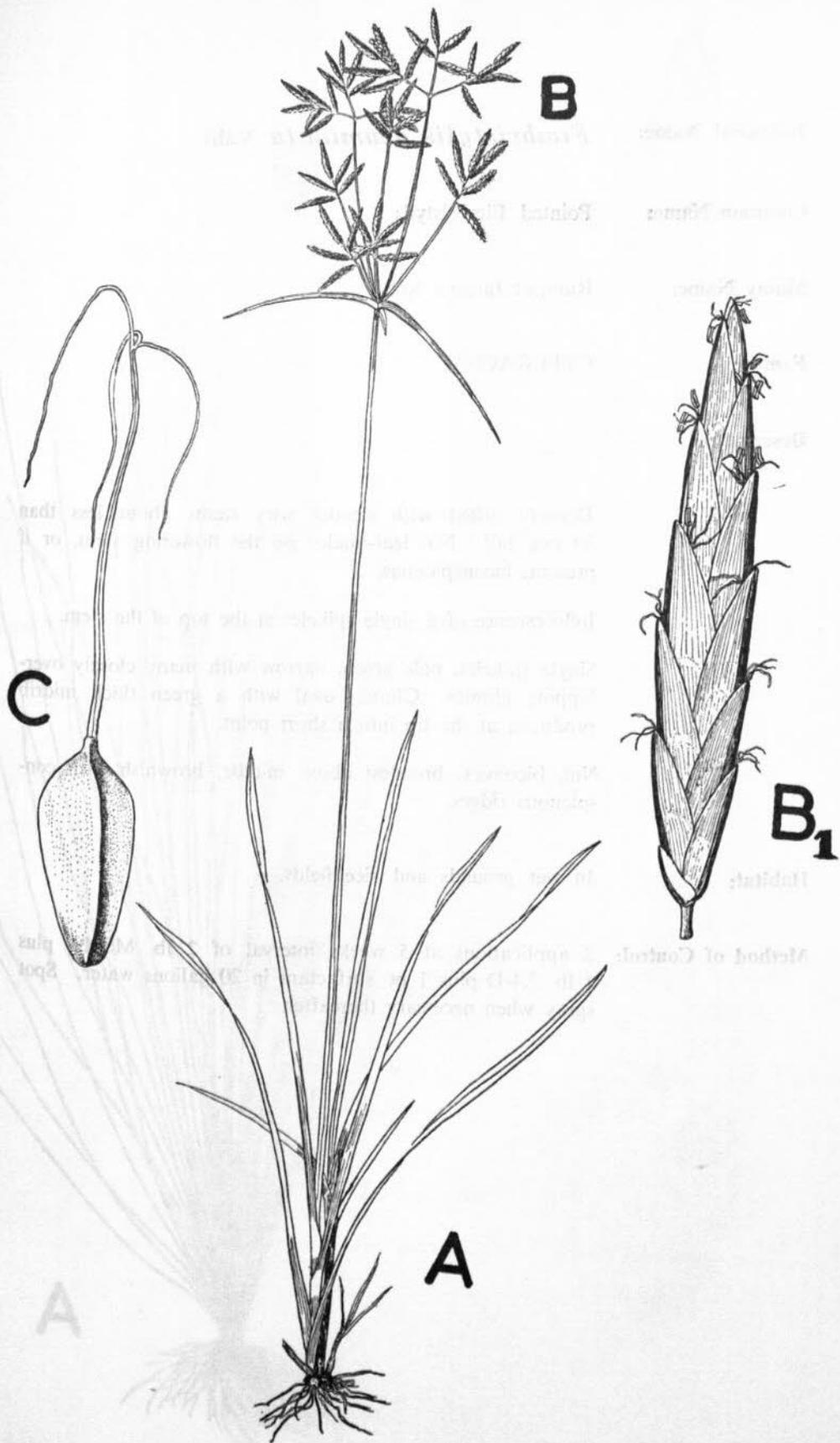
Family: CYPERACEAE

Description:

- A Stem tuberous at base and grow singly from a creeping underground rootstock, usually between 15-50 cm. tall; leaves dark green, shorter than the flowering stem, broadly grooved on the upper surface.
- B Inflorescence rather small, consists of a few slender branches.
- B1 Single spike consisting of several (2-10) spikelets pointing obliquely upwards; spikelets arranged in rows along the axis of the spike, narrow, flattened; glumes blunt and narrow, closely overlapping, reddish brown when mature; stamens and stigma projecting out.
- C Nut, 3-angled, widest above the middle, blackish when ripe.

Habitat: Common in cultivated and waste grounds.

Method of Control: Repeat applications at bi-weekly intervals of 2 lb MSMA plus 1 lb 2,4-D plus 1 pt surfactant in 20 gallons water; 5-6 rounds are normally required for satisfactory control. Best control is achieved when sprayed prior to flowering.



Botanical Name: *Fimbristylis acuminata* Vahl

Common Name: Pointed Fimbristylis

Malay Name: Rumput Janggot Keli

Family: CYPERACEAE

Description:

A Densely tufted with slender wiry stems about less than 30 cm. tall. No. leaf-blades on the flowering stem, or if present, inconspicuous.

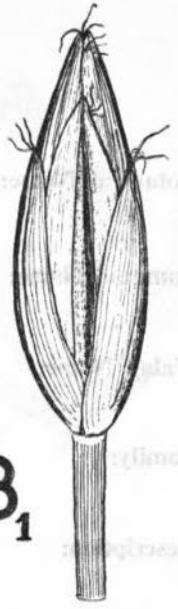
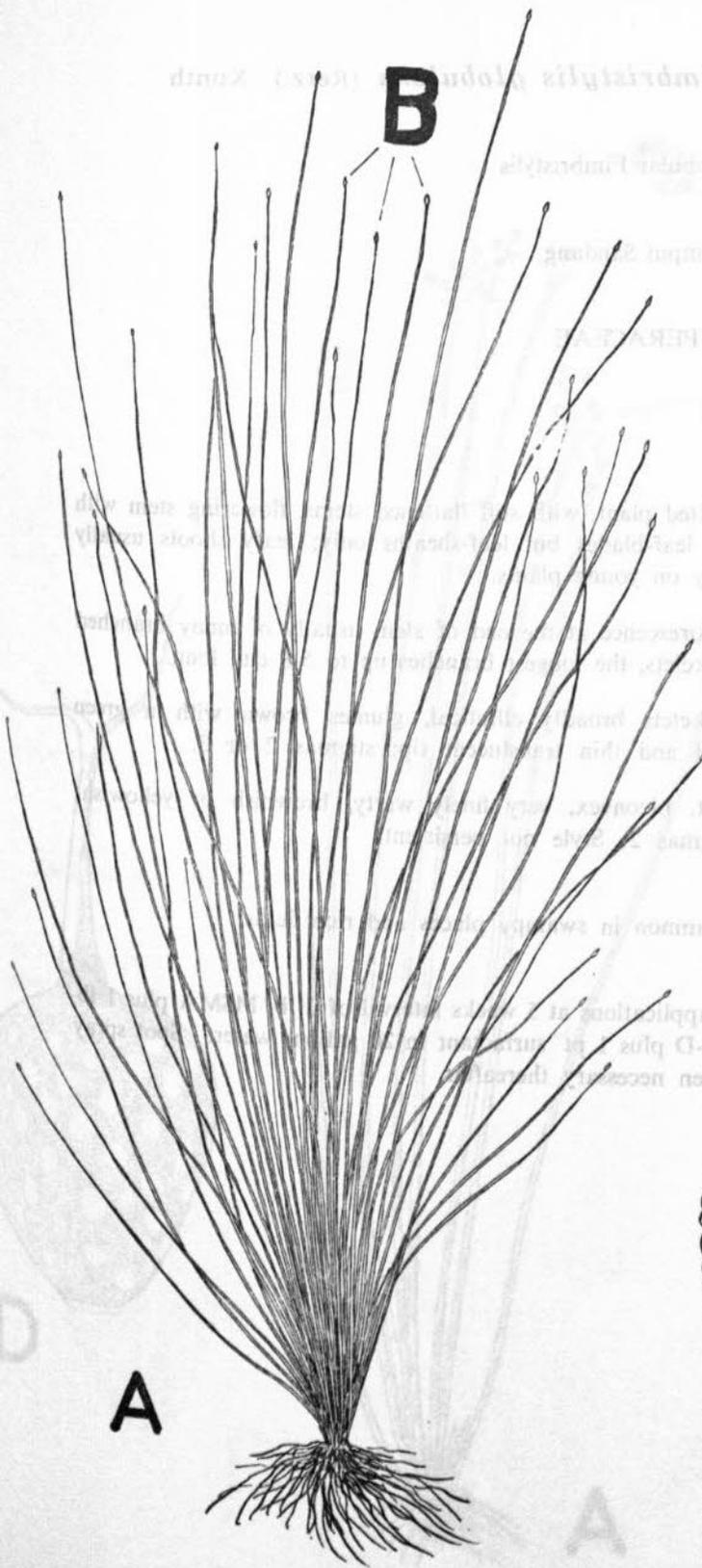
B Inflorescence of a single spikelet at the top of the stem.

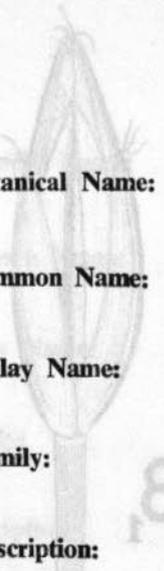
B1 Single spikelet, pale green, narrow with many closely overlapping glumes. Glumes oval with a green thick midrib produced at the tip into a short point.

C Nut, biconvex, broadest above middle, brownish with conspicuous ridges.

Habitat: In wet grounds and rice fields.

Method of Control: 2 applications at 5 weeks interval of 2 lb MSMA plus 1 lb 2,4-D plus 1 pt surfactant in 20 gallons water. Spot spray when necessary thereafter.





Botanical Name: *Fimbristylis globulosa* (Retz.) Kunth

Common Name: Globular Fimbristylis

Malay Name: Rumput Sandang

Family: CYPERACEAE

Description:

A Tufted plant, with stiff flattened stems, flowering stem with no leaf-blades but leaf-sheaths only; leafy shoots usually only on young plants.

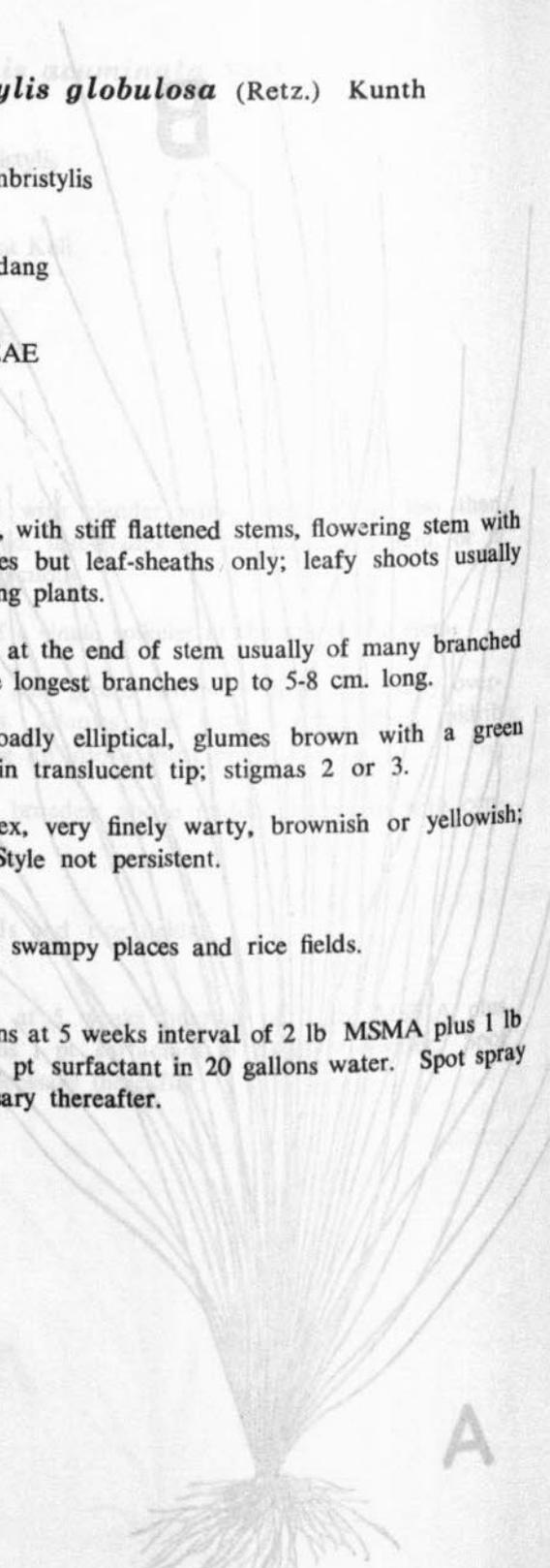
B Inflorescence at the end of stem usually of many branched spikelets, the longest branches up to 5-8 cm. long.

C Spikelets broadly elliptical, glumes brown with a green keel and thin translucent tip; stigmas 2 or 3.

D Nut, biconvex, very finely warty, brownish or yellowish; stigmas 2; Style not persistent.

Habitat: Common in swampy places and rice fields.

Method of Control: 2 applications at 5 weeks interval of 2 lb MSMA plus 1 lb 2,4-D plus 1 pt surfactant in 20 gallons water. Spot spray when necessary thereafter.



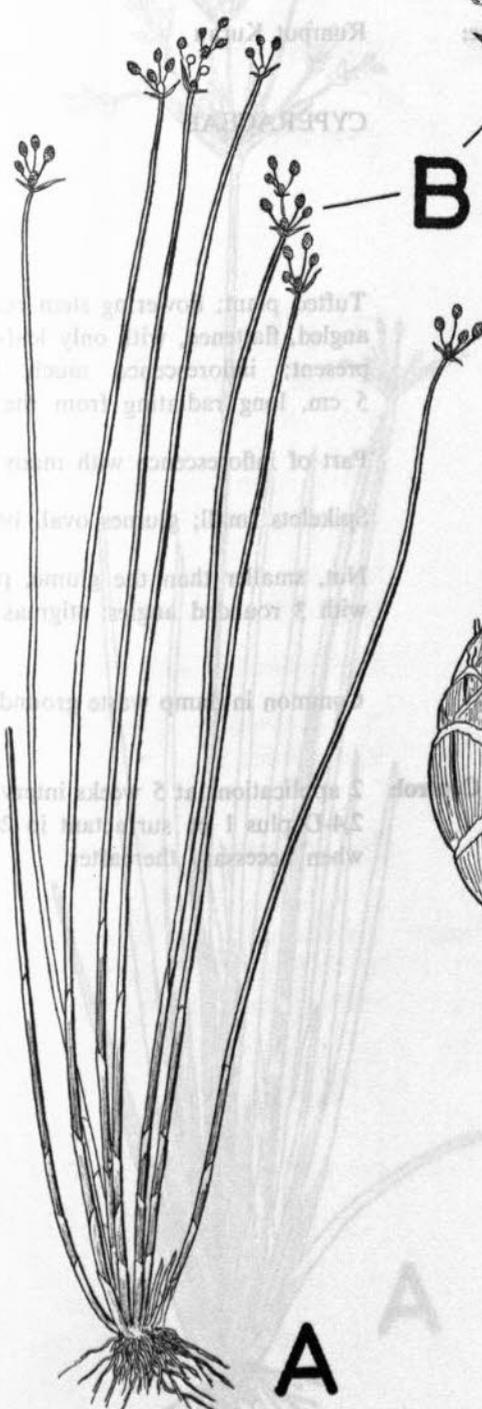
Fimbristylis millicomii (Vahl)

Family: Cyperaceae

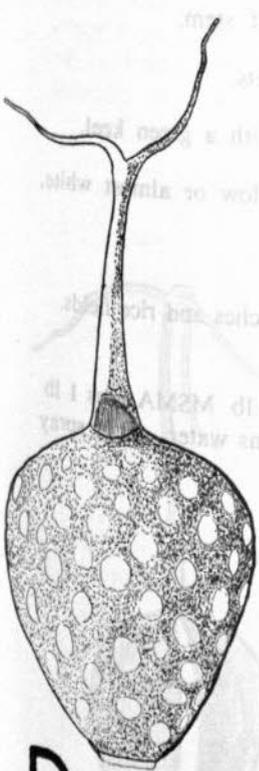
Order: Cyperales



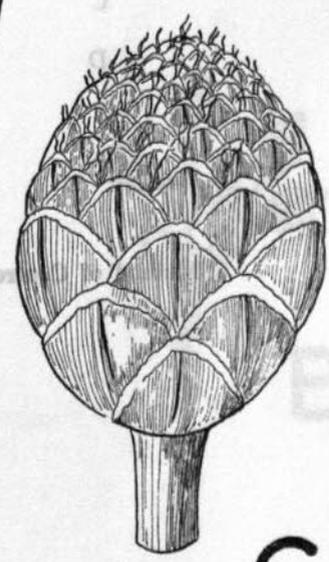
B



A



D



C

Botanical Name: *Fimbristylis miliacea* (Linn.) Vahl.

Common Name: Lesser Fimbristylis

Malay Name: Rumput Kurau

Family: CYPERACEAE

Description:

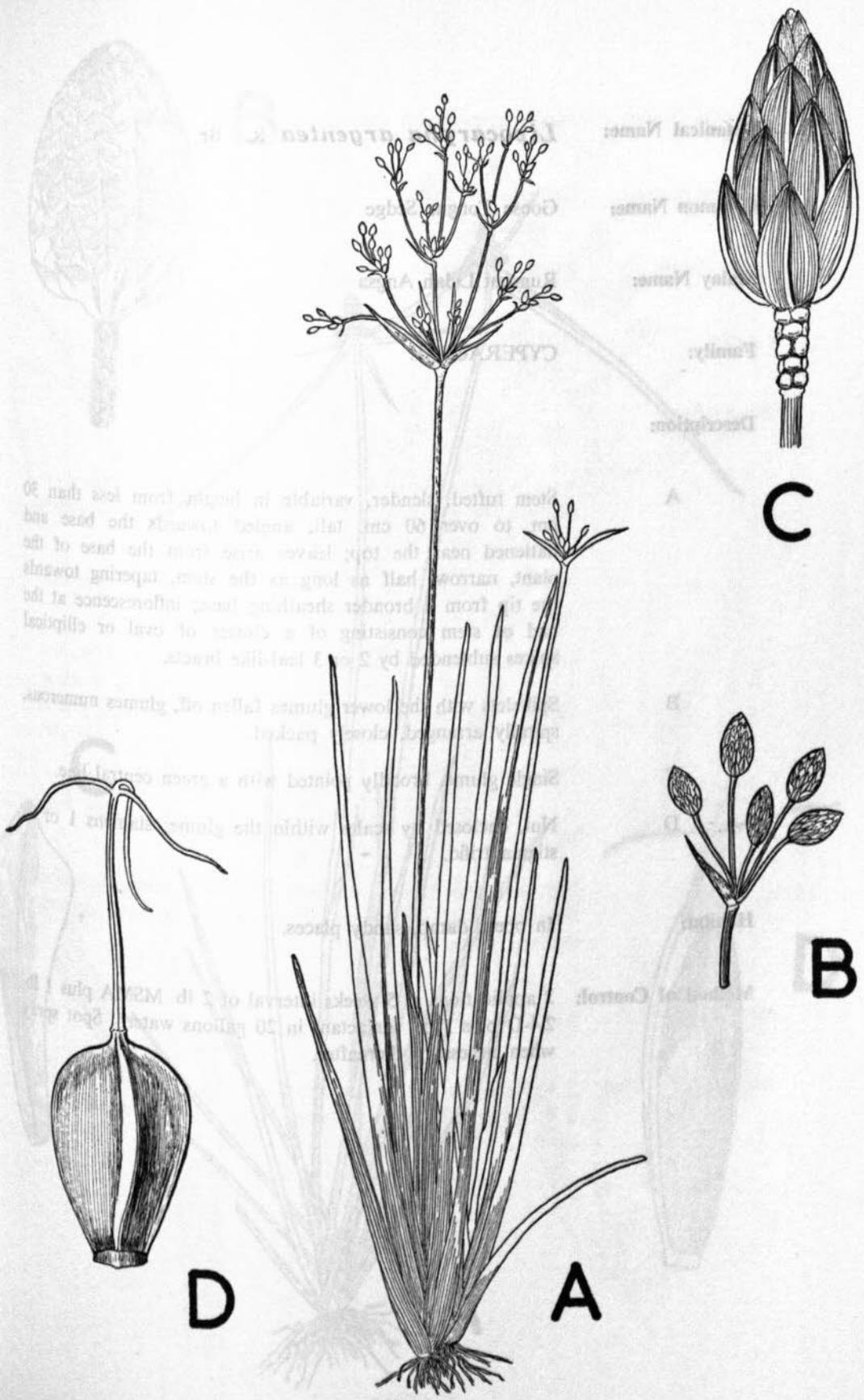
- A Tufted plant; flowering stem reaching about 50 cm. tall, 4-angled, flattened, with only leaf-sheaths; leafy shoots always present; inflorescence much branched, branches about 5 cm. long radiating from the end of stem.
- B Part of inflorescence with many spikelets.
- C Spikelets small; glumes oval, brown with a green keel.
- D Nut, smaller than the glume, pale yellow or almost white, with 3 rounded angles; stigmas 3.

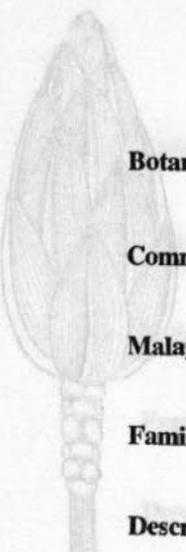
Habitat:

Common in damp waste ground, in ditches and rice fields.

Method of Control:

2 applications at 5 weeks interval of 2 lb MSMA plus 1 lb 2,4-D plus 1 pt surfactant in 20 gallons water. Spot spray when necessary thereafter.





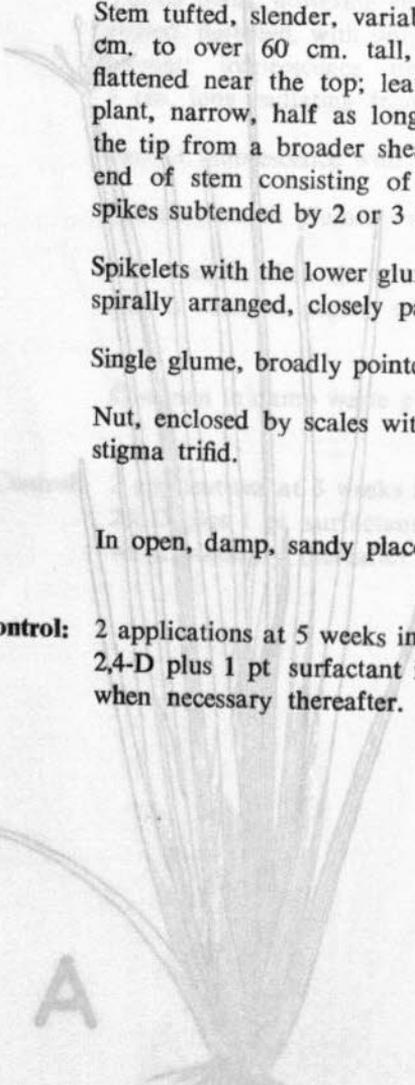
Botanical Name: *Lipocarpa argentea* R. Br.

Common Name: Goose Tongue Sedge

Malay Name: Rumput Lidah Angsa

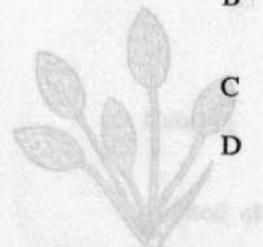
Family: CYPERACEAE

Description:



A Stem tufted, slender, variable in height from less than 30 cm. to over 60 cm. tall, angled towards the base and flattened near the top; leaves arise from the base of the plant, narrow, half as long as the stem, tapering towards the tip from a broader sheathing base; inflorescence at the end of stem consisting of a cluster of oval or elliptical spikes subtended by 2 or 3 leaf-like bracts.

B Spikelets with the lower glumes fallen off, glumes numerous, spirally arranged, closely packed.



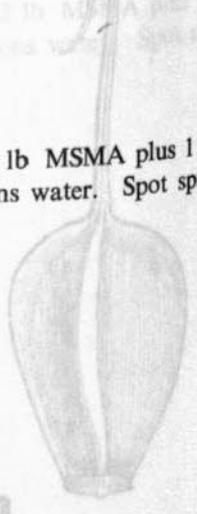
C Single glume, broadly pointed with a green central line.

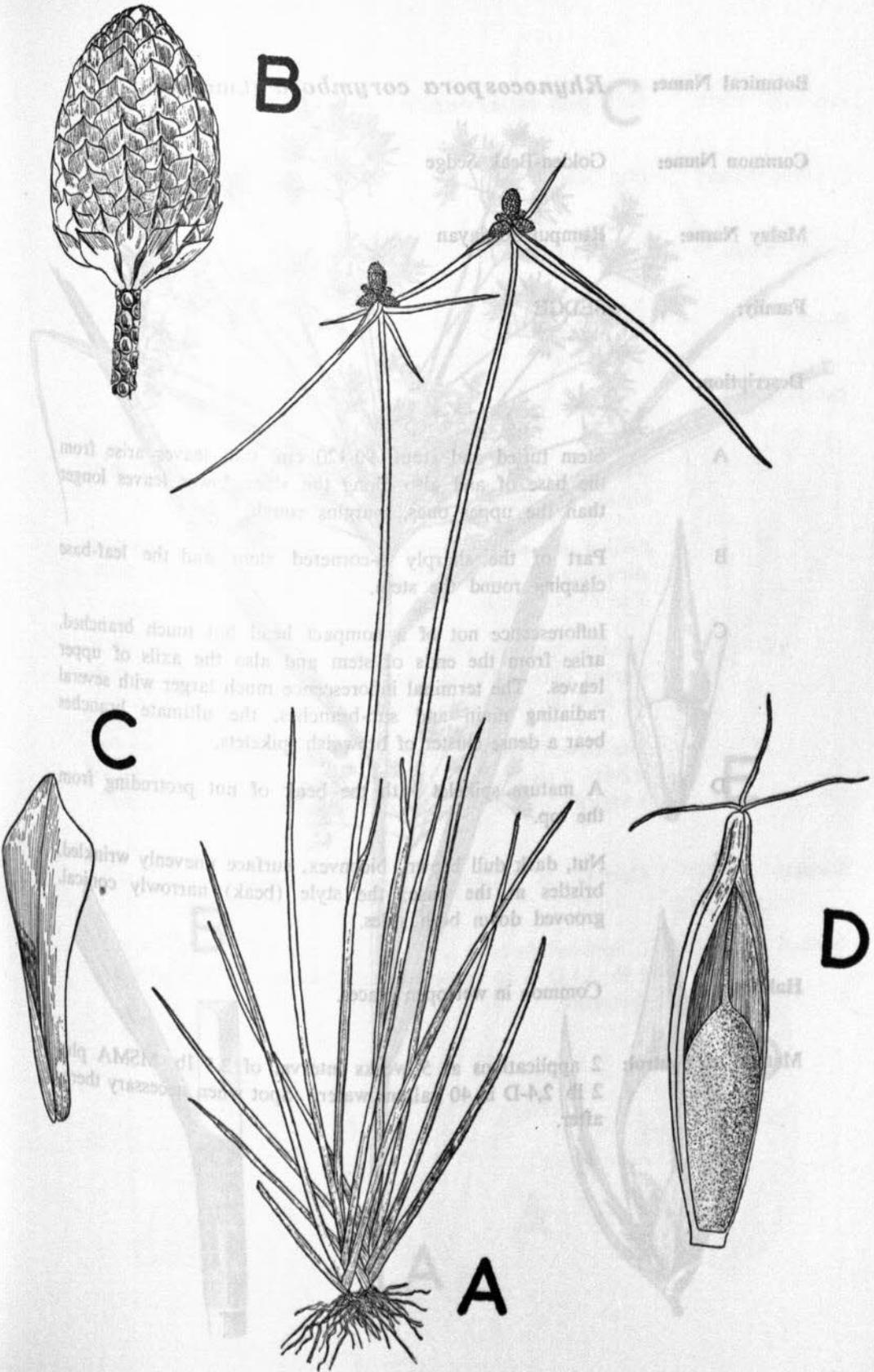
D Nut, enclosed by scales within the glume; stamens 1 or 2; stigma trifid.



Habitat: In open, damp, sandy places.

Method of Control: 2 applications at 5 weeks interval of 2 lb MSMA plus 1 lb 2,4-D plus 1 pt surfactant in 20 gallons water. Spot spray when necessary thereafter.





Botanical Name: *Rhynchospora corymbosa* (Linn.) Britt.

Common Name: Golden-Beak Sedge

Malay Name: Rumput Sendayan

Family: SEDGE

Description:

A Stem tufted and stout, 90-120 cm. tall; leaves arise from the base of and also along the stem, lower leaves longer than the upper ones, margins rough.

B Part of the sharply 3-cornered stem and the leaf-base clasping round the stem.

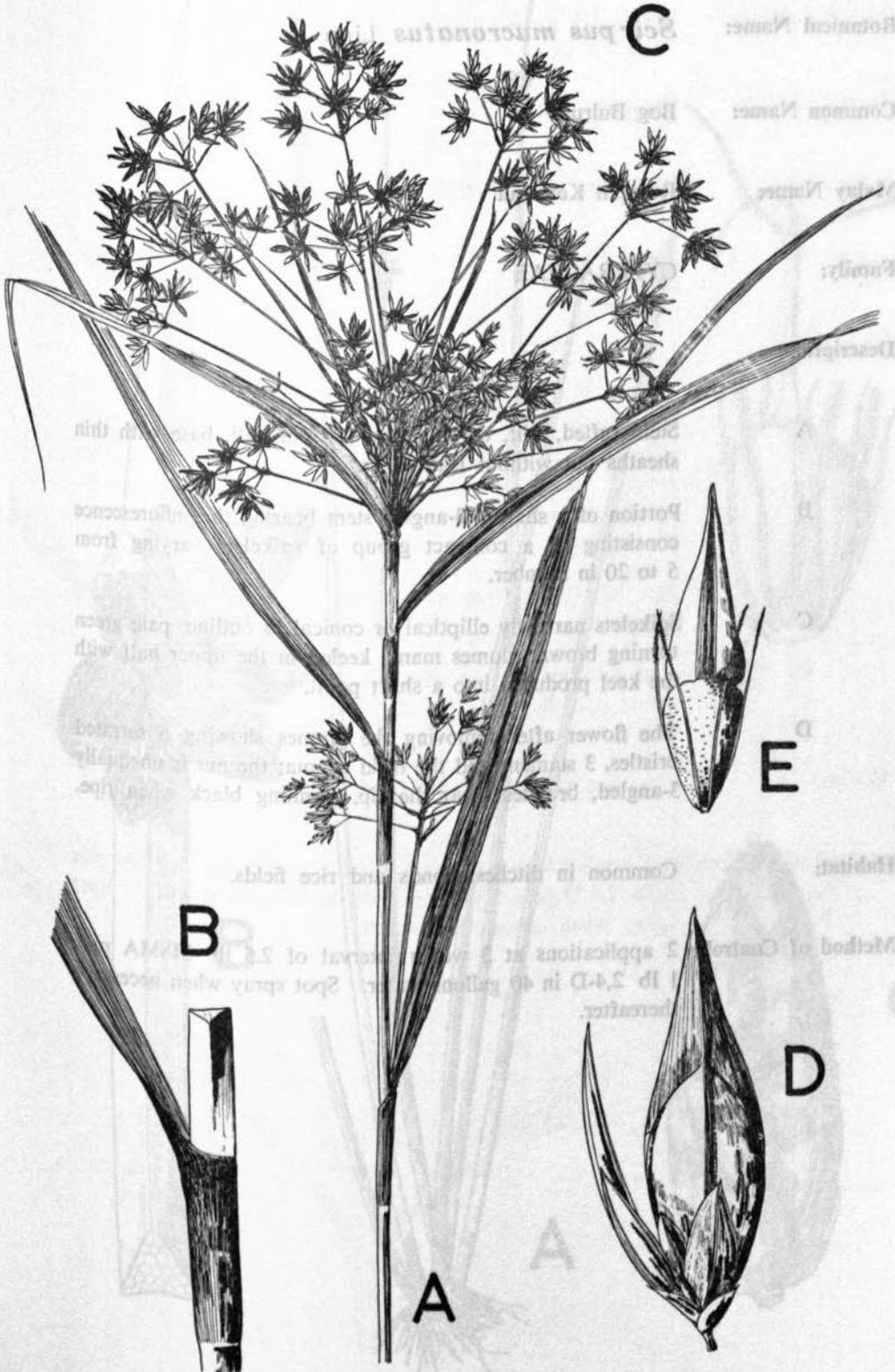
C Inflorescence not of a compact head but much branched, arise from the ends of stem and also the axils of upper leaves. The terminal inflorescence much larger with several radiating main and sub-branches, the ultimate branches bear a dense cluster of brownish spikelets.

D A mature spikelet with the beak of nut protruding from the top.

E Nut, dark dull brown, biconvex, surface unevenly wrinkled, bristles at the base; the style (beak) narrowly conical, grooved down both sides.

Habitat: Common in wet open places.

Method of Control: 2 applications at 5 weeks interval of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water. Spot when necessary thereafter.



Botanical Name: *Scirpus mucronatus* Linn

Common Name: Bog Bulrush

Malay Name: Rumput Kerechut

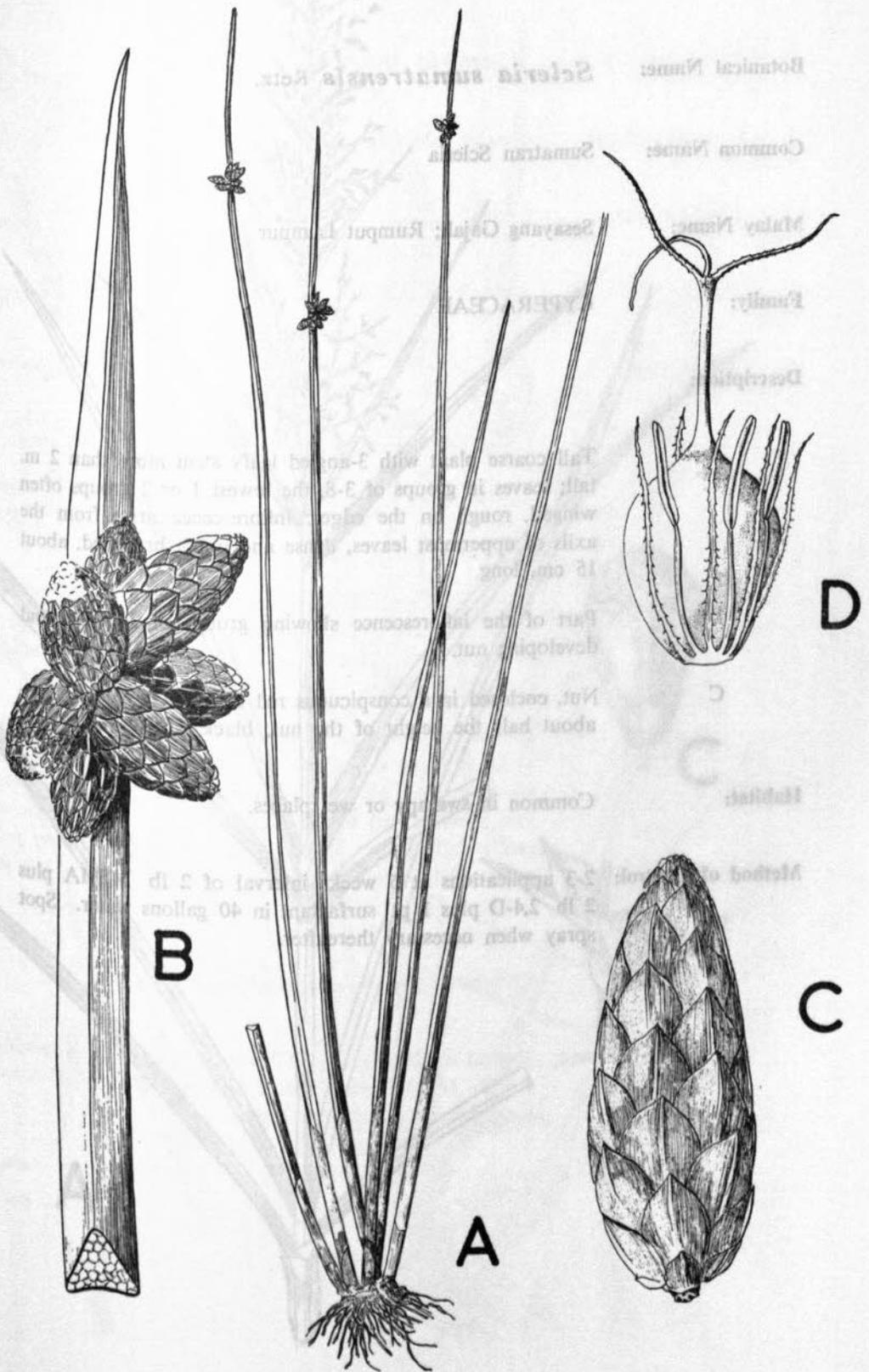
Family: CYPERACEAE

Description:

- A Stem tufted, stiff, up to about 120 cm. tall, base with thin sheaths but without leaf blades.
- B Portion of a sharply 3-angled stem bearing the inflorescence consisting of a compact group of spikelets varying from 5 to 20 in number.
- C Spikelets narrowly elliptical or conical in outline, pale green turning brown; glumes many, keeled in the upper half with the keel produced into a short point.
- D The flower after removing the glumes showing 6 serrated bristles, 3 stamens and the trifold stigma; the nut is unequally 3-angled, broadest near the tip, shining black when ripe.

Habitat: Common in ditches, ponds and rice fields.

Method of Control: 2 applications at 3 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray when necessary thereafter.



Scleria sumatrensis Roxb.

Botanical Name:

Sumatran Scleria

Common Name:

Sesayang Grass; Rumpun Lamun

Malay Name:

HYPERICACEAE

Family:

Description:

Tillaceous plant with 3-angled stem with 2 m. tall, leaves in groups of 3-5, the lower 1 or 2 often with rough or the upper glabrous. The inflorescence is a spikelet with 1 or 2 flowers. The spikelet is elongated, oval-shaped, and covered with overlapping bracts. The flowers are small and arranged in a dense cluster.

Part of the inflorescence showing the developing ovary and stamens. The ovary is small and rounded, and the stamens are long and thin.

Not, except the conspicuous part of the inflorescence, about half the size of the whole plant. Common in lowland or wetland areas.

Method of preparation: The whole plant is dried and then crushed. The powder is used for medicinal purposes. It is also used as a natural dye.

Botanical Name: *Scleria sumatrensis* Retz.

Common Name: Sumatran Scleria

Malay Name: Sesayang Gajah; Rumpit Lumpur

Family: CYPERACEAE

Description:

A

Tall coarse plant with 3-angled leafy stem more than 2 m. tall; leaves in groups of 3-8, the lowest 1 or 2 groups often winged, rough on the edges; inflorescence arise from the axils of uppermost leaves, dense and much branched, about 15 cm. long.

B

Part of the inflorescence showing groups of spikelets and developing nut.

C

Nut, enclosed in a conspicuous red disc which forms a cup about half the height of the nut, black when ripe.

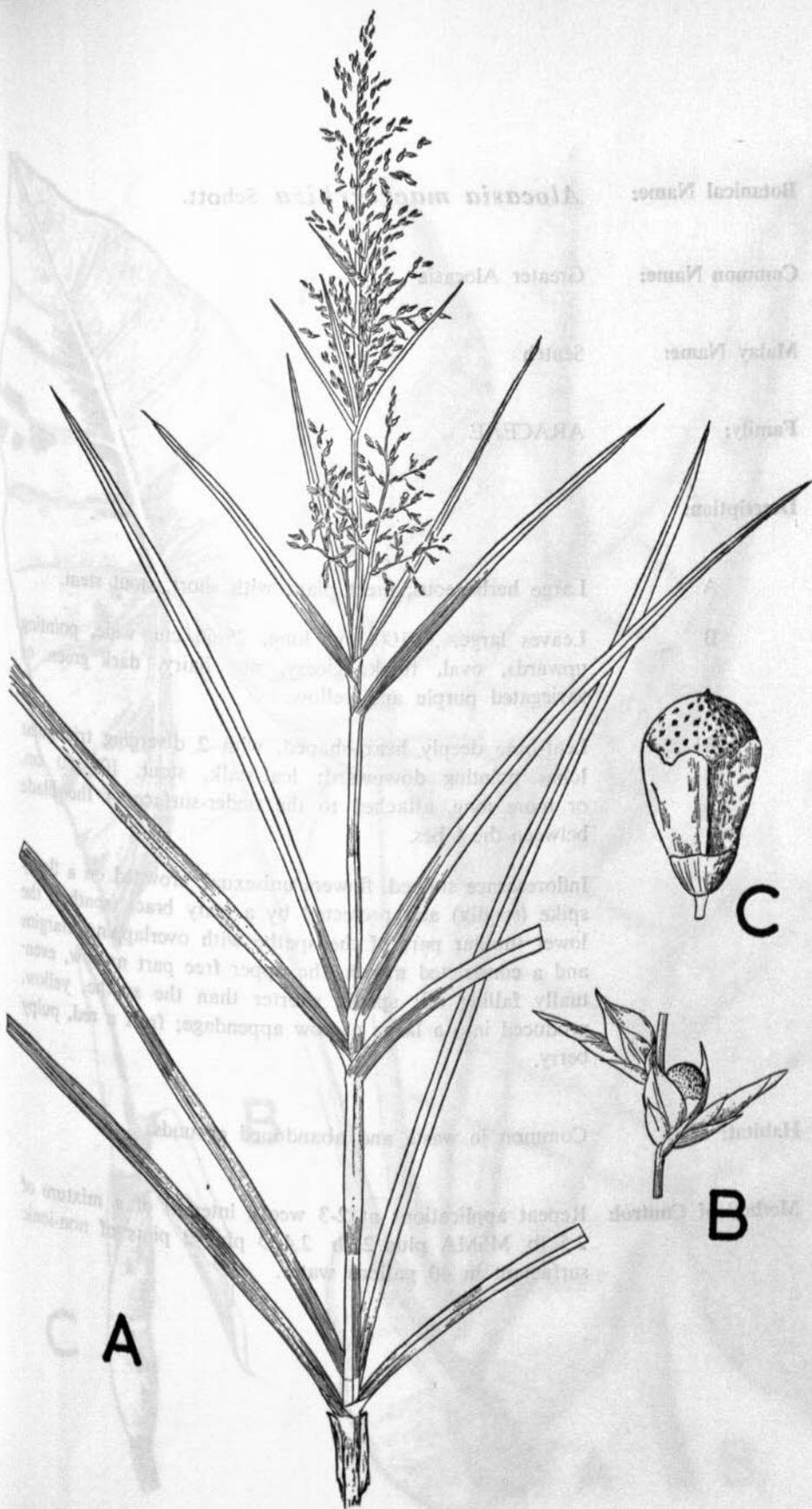
Habitat: Common in swampy or wet places.

Method of Control: 2-3 applications at 5 weeks interval of 2 lb MSMA plus 2 lb 2,4-D plus 1 pt surfactant in 40 gallons water. Spot spray when necessary thereafter.

Botanical Name: *Allocasia macrorrhiza* Schott.

Common Name: Greater Allocasia

Family: Araceae



Botanical Name: *Alocasia macrorrhiza* Schott.

Common Name: Greater Alocasia

Malay Name: Senteh

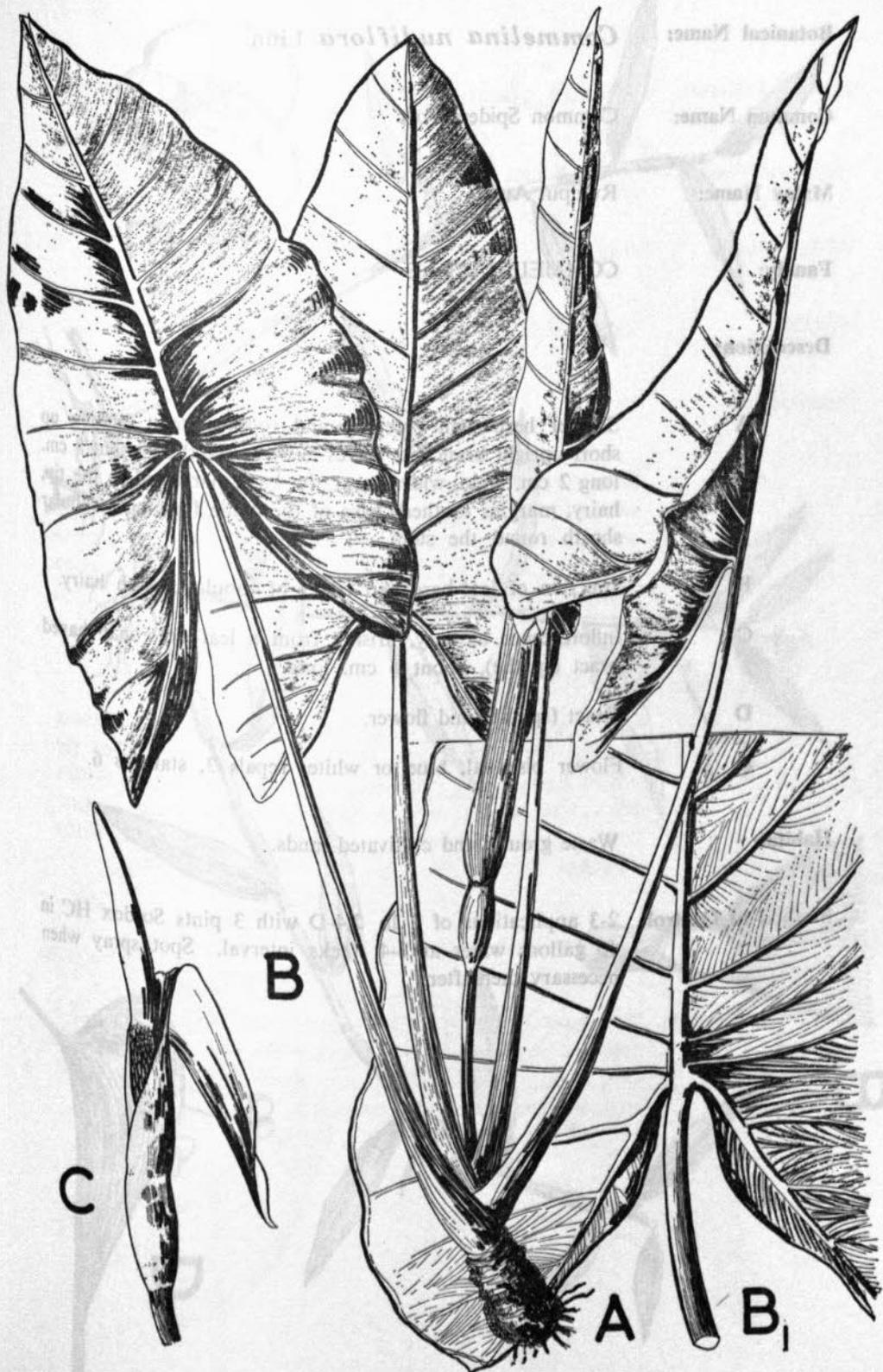
Family: ARACEAE

Description:

- A Large herbaceous, erect plant with short, stout stem.
- B Leaves large, 30-100 cm. long, 25-60 cm. wide, pointing upwards, oval, thick, glossy, not hairy, dark green or variegated purple and yellow.
- B1 Leaf-base deeply heart-shaped, with 2 diverging triangular lobes pointing downward; leaf-stalk, stout, 100-150 cm. or more long, attached to the under-surface of the blade between the lobes.
- C Inflorescence stalked, flowers unisexual, crowded on a fleshy spike (spadix) and protected by a leafy bract (spathe); the lower tubular part of the spathe with overlapping margins and a constricted mouth, the upper free part narrow, eventually falling off; spadix shorter than the spathe, yellow, produced into a large narrow appendage; fruit a red, pulpy berry.

Habitat: Common in waste and abandoned grounds.

Method of Control: Repeat applications at 2-3 weeks interval of a mixture of 2.5 lb MSMA plus 2 lb 2,4-D plus 2 pints of non-ionic surfactant in 40 gallons water.



Botanical Name: *Commelina nudiflora* Linn.

Common Name: Common Spider Wort

Malay Name: Rumput Aur.

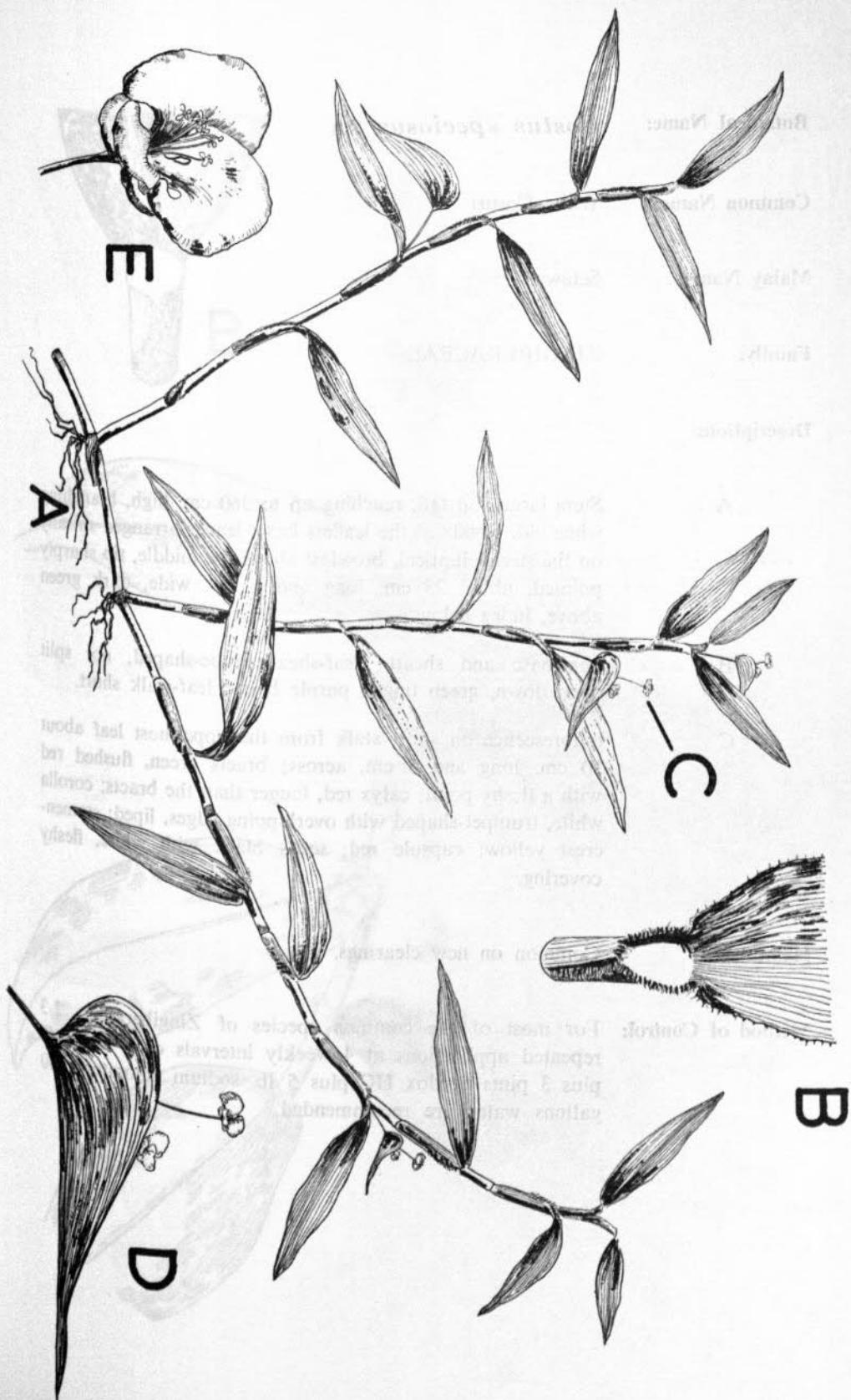
Family: COMMELINACEAE

Description:

- A Slender herb with creeping and rooting stem, sending up short upright branches; leaves narrow, stalkless, about 8 cm. long 2 cm. wide, widest near the base, narrowed to the tip, hairy, margins toothed, base of the blade forming a tubular sheath round the stem.
- B Junction of leaf-base and edges of tubular sheath hairy.
- C Inflorescence axillary, arising from a leaf-like, boat-shaped bract (spathe), about 4 cm. long.
- D Bract (spathe) and flower.
- E Flower bisexual, blue or white; sepals 3, stamens 6.

Habitat: Waste ground and cultivated lands.

Method of Control: 2-3 applications of 2 lb 2,4-D with 3 pints Sordox HC in 40 gallons water at 3-4 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Costus speciosus* Sm.

Common Name: White Costus

Malay Name: Setawar

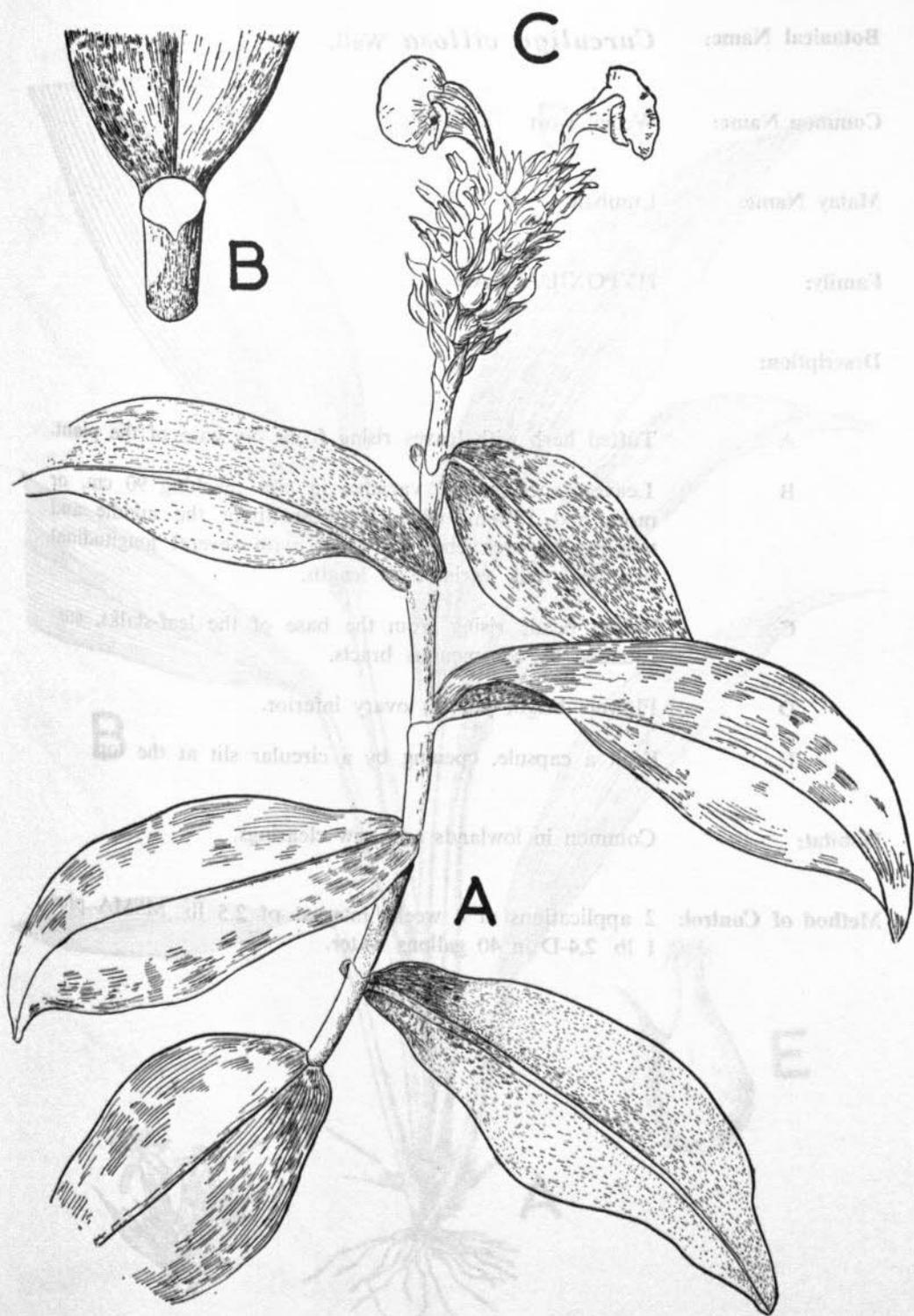
Family: ZINGIBERACEAE

Description:

- A Stem large and tall, reaching up to 360 cm. high, branching when old, woody at the leafless base; leaves arranged spirally on the stem, elliptical, broadest above the middle, tip sharply pointed, about 25 cm. long and 6 cm. wide, dark green above, hairy below.
- B Leaf-base and sheath; leaf-sheath tube-shaped, not split open down, green tinged purple hairy; leaf-stalk short.
- C Inflorescence on short stalk from the uppermost leaf about 10 cm. long and 5 cm. across; bracts green, flushed red with a fleshy point; calyx red, longer than the bracts; corolla white, trumpet-shaped with overlapping edges, lipped; stamen-crest yellow; capsule red; seeds black with white, fleshy covering.

Habitat: Common on new clearings.

Method of Control: For most of the common species of Zingiberaceae, 2-3 repeated applications at 4 weekly intervals of 2 lb 2,4-D plus 3 pints Sordox HC plus 5 lb sodium chlorate in 40 gallons water are recommended.



Botanical Name: *Curculigo villosa* Wall.

Common Name: Weevil wort

Malay Name: Lumbah

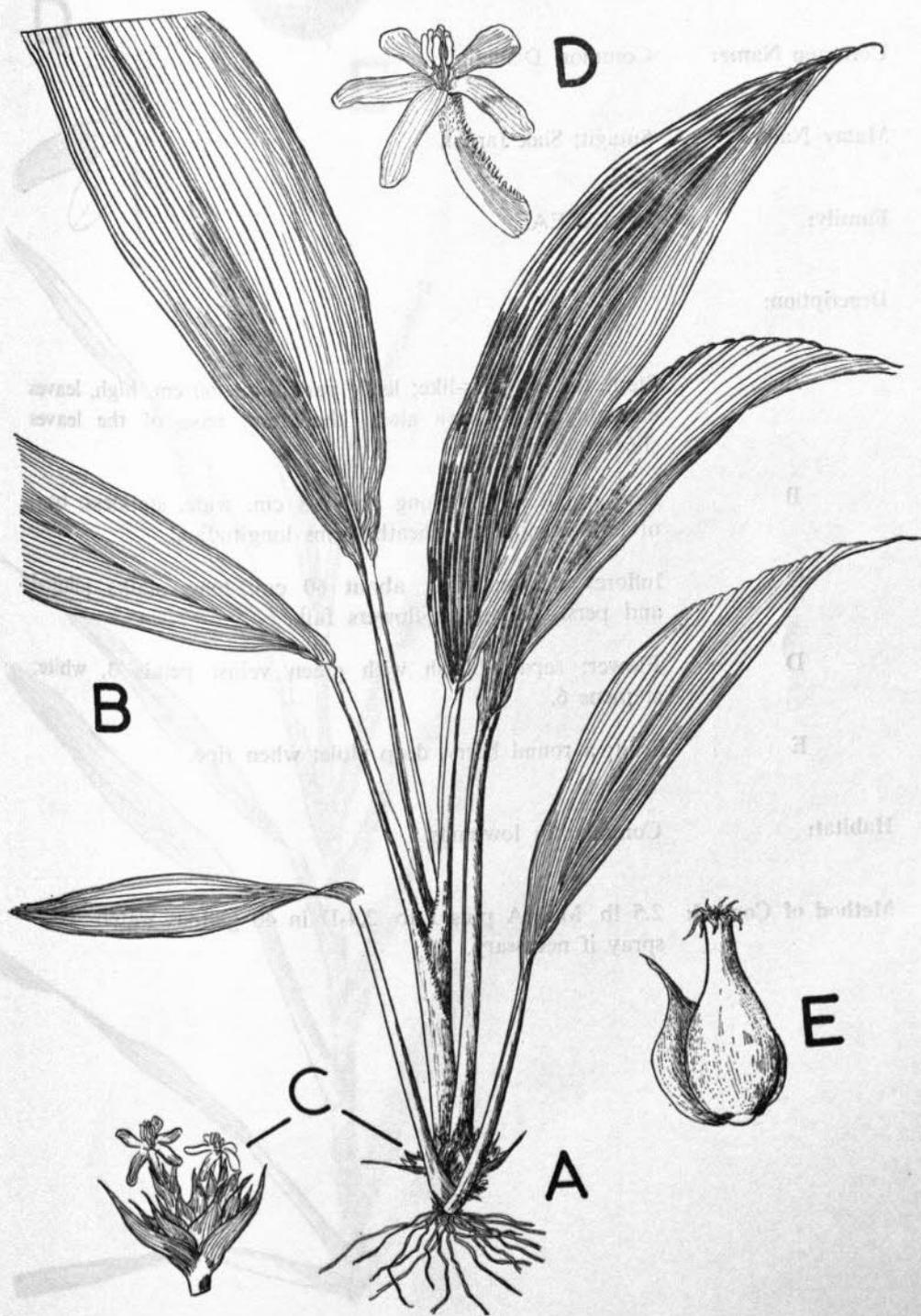
Family: HYPOXIDACEAE

Description:

- A Tufted herb with leaves rising from the base of the plant.
- B Leaves lance-shaped, variable in size reaching 90 cm. or more and 15 cm. wide, broadest about the middle and tapering to each end, leaf-blade with several longitudinal ribs; leaf-stalk variable in length.
- C Flower heads rising from the base of the leaf-stalks, surrounded by conspicuous bracts.
- D Flowers bright yellow; ovary inferior.
- F Fruit a capsule, opening by a circular slit at the top.

Habitat: Common in lowlands and new clearings.

Method of Control: 2 applications at 4 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water.



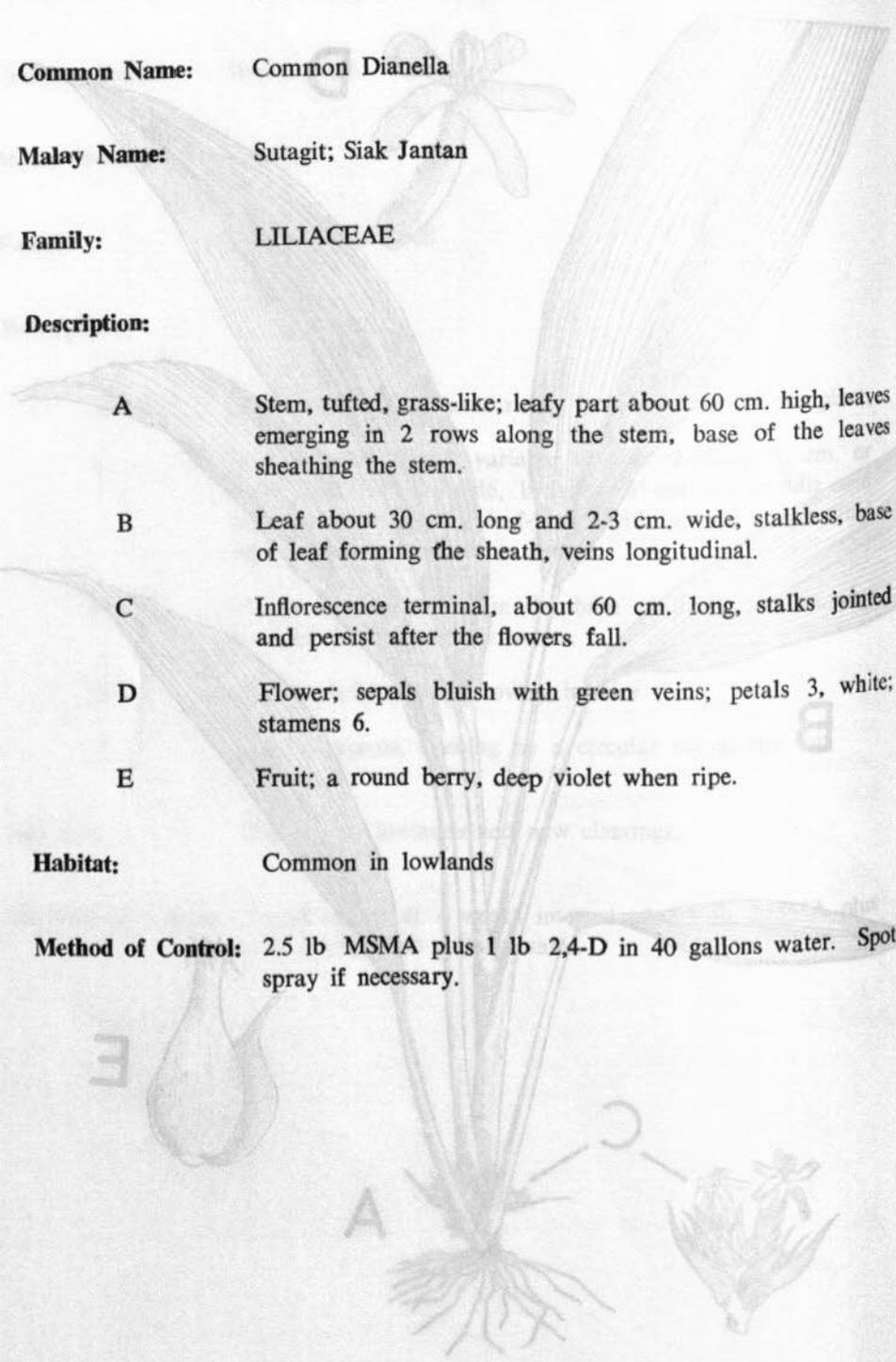
Botanical Name: *Dianella nemerosa* Lam.

Common Name: Common Dianella

Malay Name: Sutagit; Siak Jantan

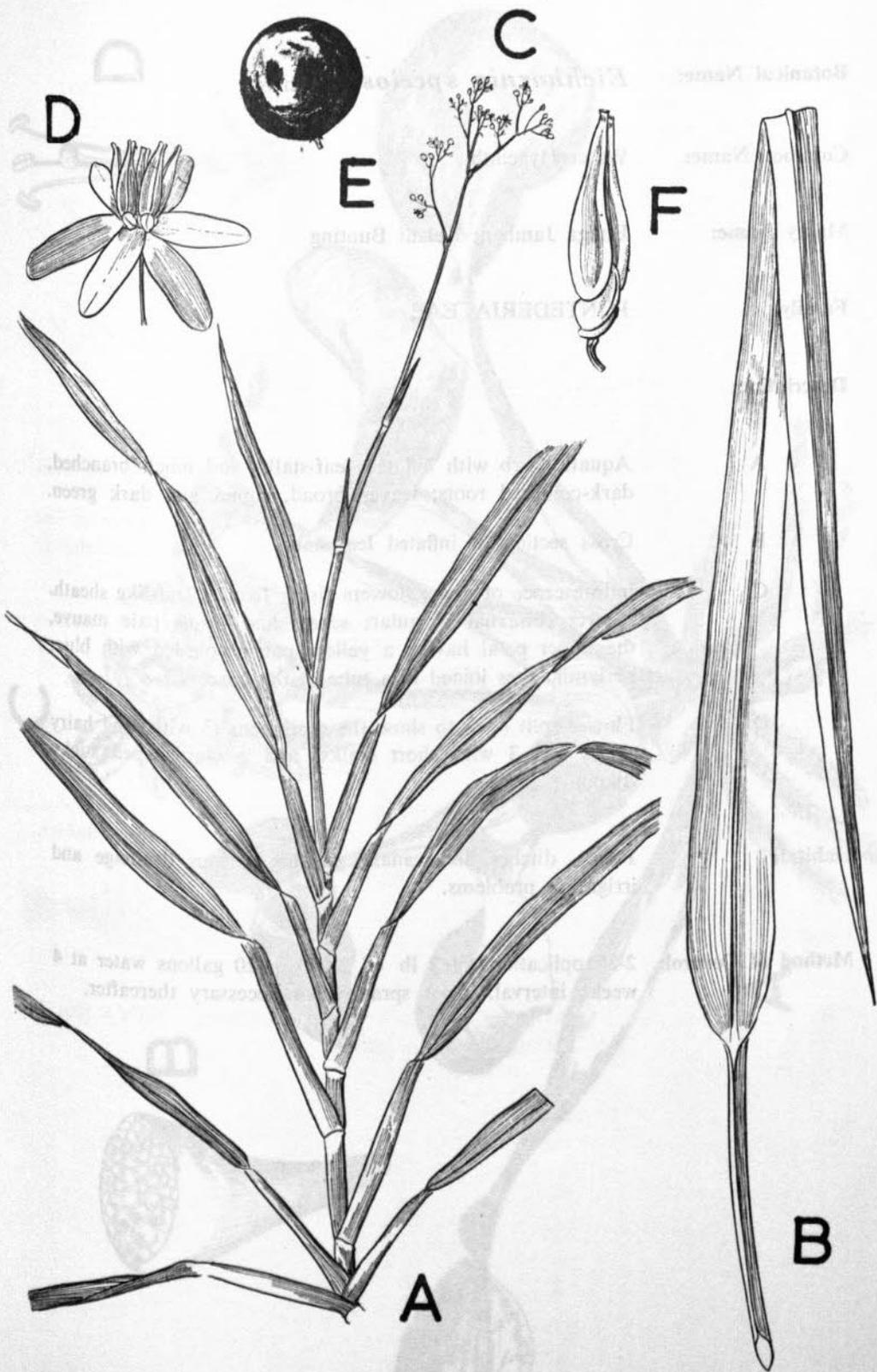
Family: LILIACEAE

Description:

- 
- A Stem, tufted, grass-like; leafy part about 60 cm. high, leaves emerging in 2 rows along the stem, base of the leaves sheathing the stem.
- B Leaf about 30 cm. long and 2-3 cm. wide, stalkless, base of leaf forming the sheath, veins longitudinal.
- C Inflorescence terminal, about 60 cm. long, stalks jointed and persist after the flowers fall.
- D Flower; sepals bluish with green veins; petals 3, white; stamens 6.
- E Fruit; a round berry, deep violet when ripe.

Habitat: Common in lowlands

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray if necessary.



Botanical Name: *Eichhornia speciosa* Kunth.

Common Name: Water Hyacinth

Malay Name: Bunga Jamban; Keladi Bunting

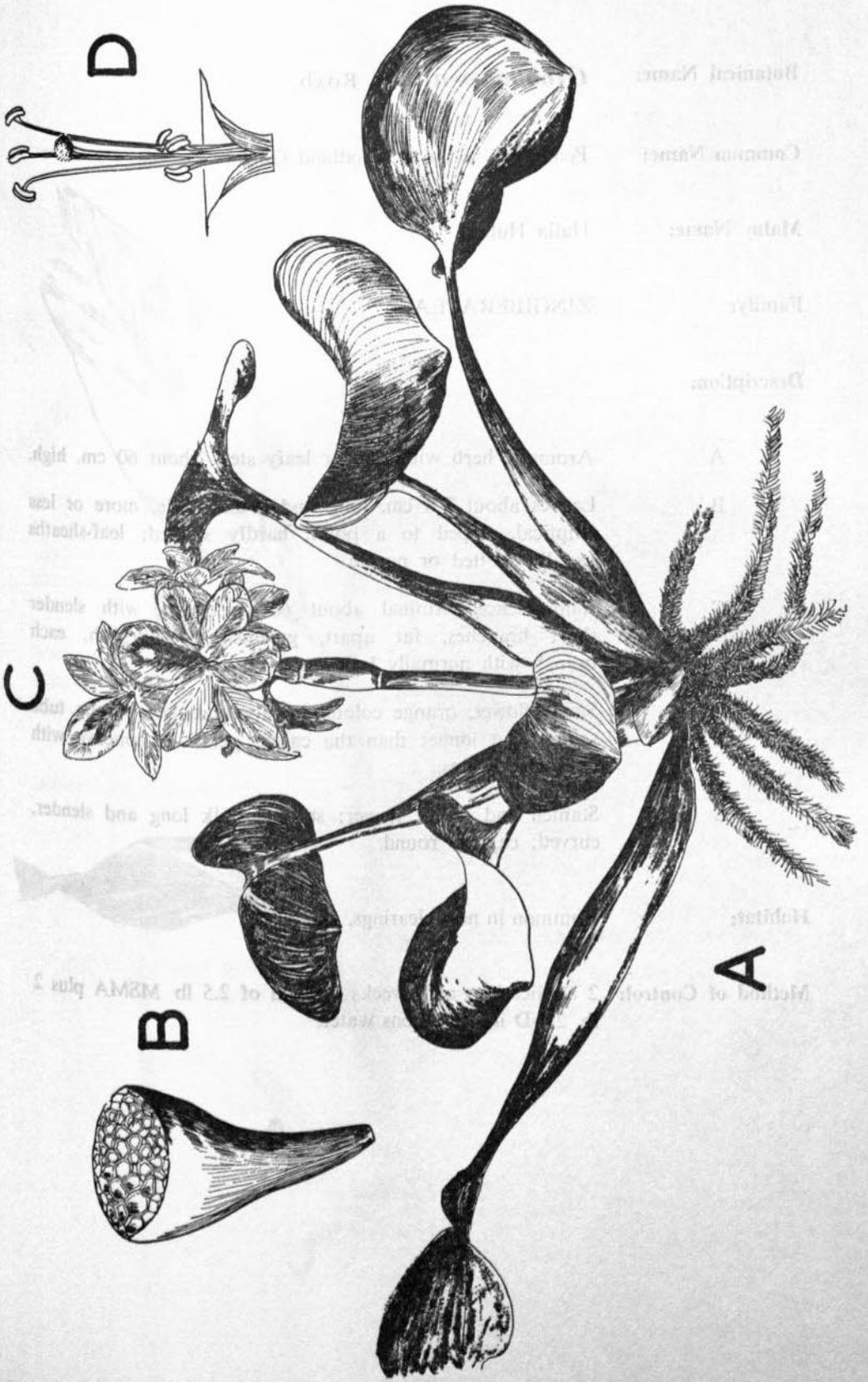
Family: PONTEDERIACEAE

Description:

- A Aquatic herb with inflated leaf-stalks and much branched, dark-coloured roots; leaves broad, round and dark green.
- B Cross section of inflated leaf-stalk.
- C Inflorescence of many flowers rising from a leaf-like sheath. Flowers bisexual irregular; sepals and petals pale mauve, the upper petal having a yellow patch bordered with blue; perianth lobes joined in a tube at the base.
- D Flower split open to show the 6 stamens (3 with long hairy stalks and 3 with short stalks) and a club-shaped sticky stigma.

Habitat: Ponds, ditches and canals; causing serious drainage and irrigation problems.

Method of Control: 2-3 applications of 2 lb of 2,4-D in 20 gallons water at 4 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Globba pendula* Roxb.

Common Name: Pendulous Globba; Woodland Ginger

Malay Name: Halia Hutan

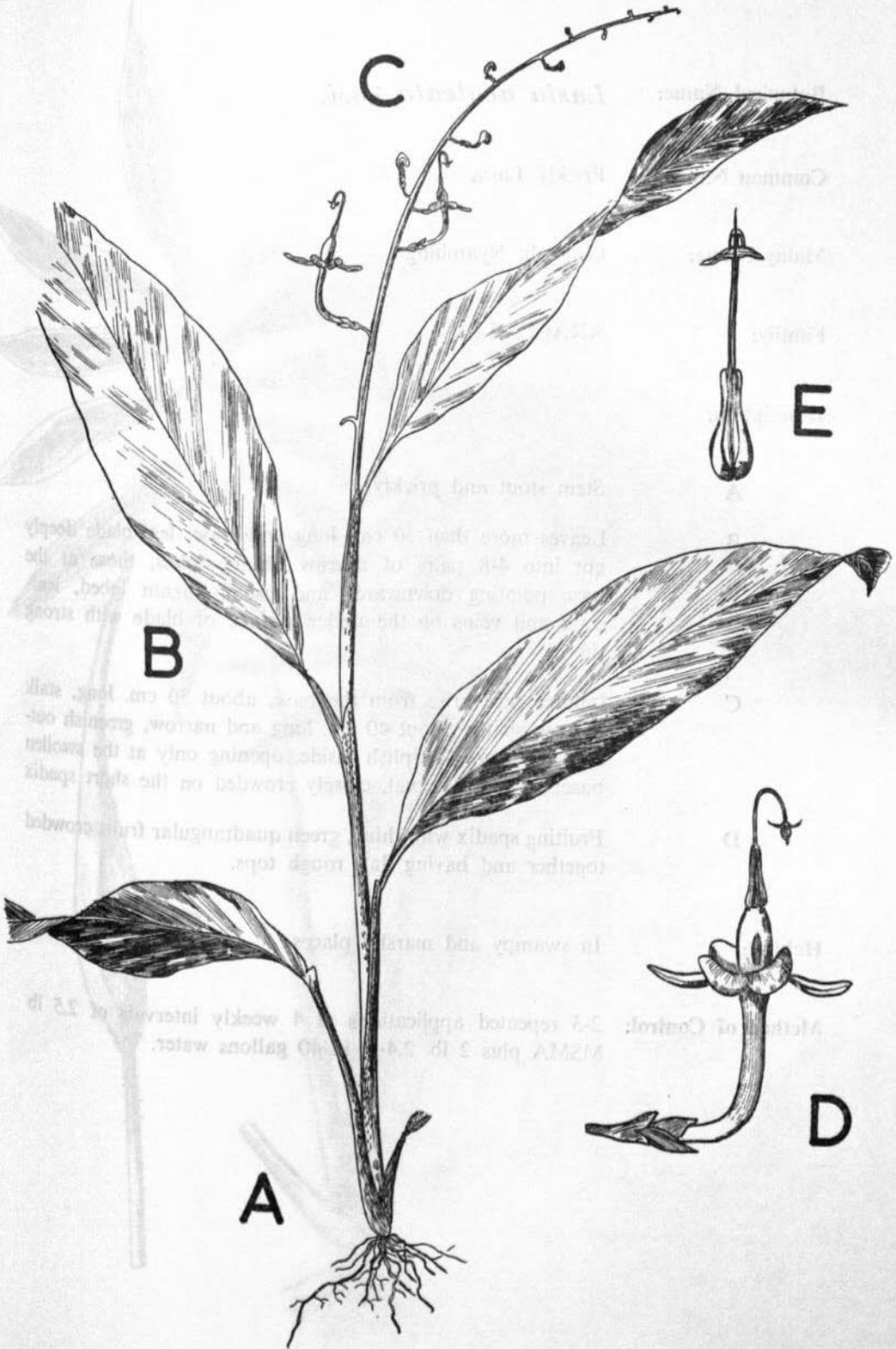
Family: ZINGIBERACEAE

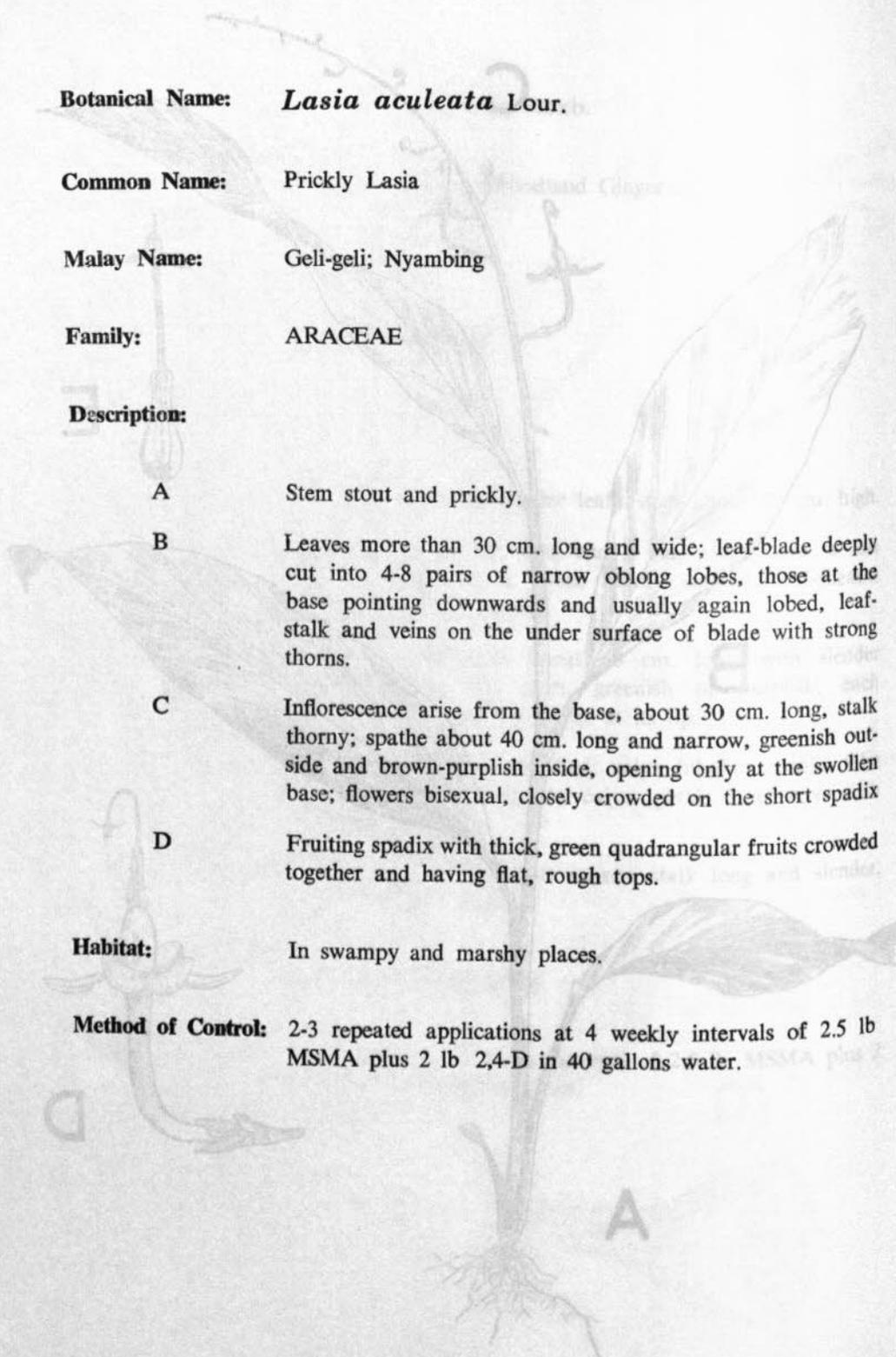
Description:

- A Aromatic herb with slender leafy stem about 60 cm. high.
- B Leaves about 7-8 cm. long and 1 cm. wide, more or less elliptical, tipped to a point, hardly stalked; leaf-sheaths usually spotted or purple.
- C Inflorescence terminal about 60 cm. long, with slender short branches, far apart, greenish or purplish, each branch with normally 1 flower at its tip.
- D Single flower, orange coloured; calyx tubular; corolla tube slender and longer than the calyx; petals 3, concave with conspicuous lips.
- E Stamen and lip of flower; stamen stalk long and slender, curved; capsule round.

Habitat: Common in new clearings.

Method of Control: 2 applications at 4 weeks interval of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water.





Botanical Name: *Lasia aculeata* Lour.

Common Name: Prickly Lasia

Malay Name: Geli-geli; Nyambing

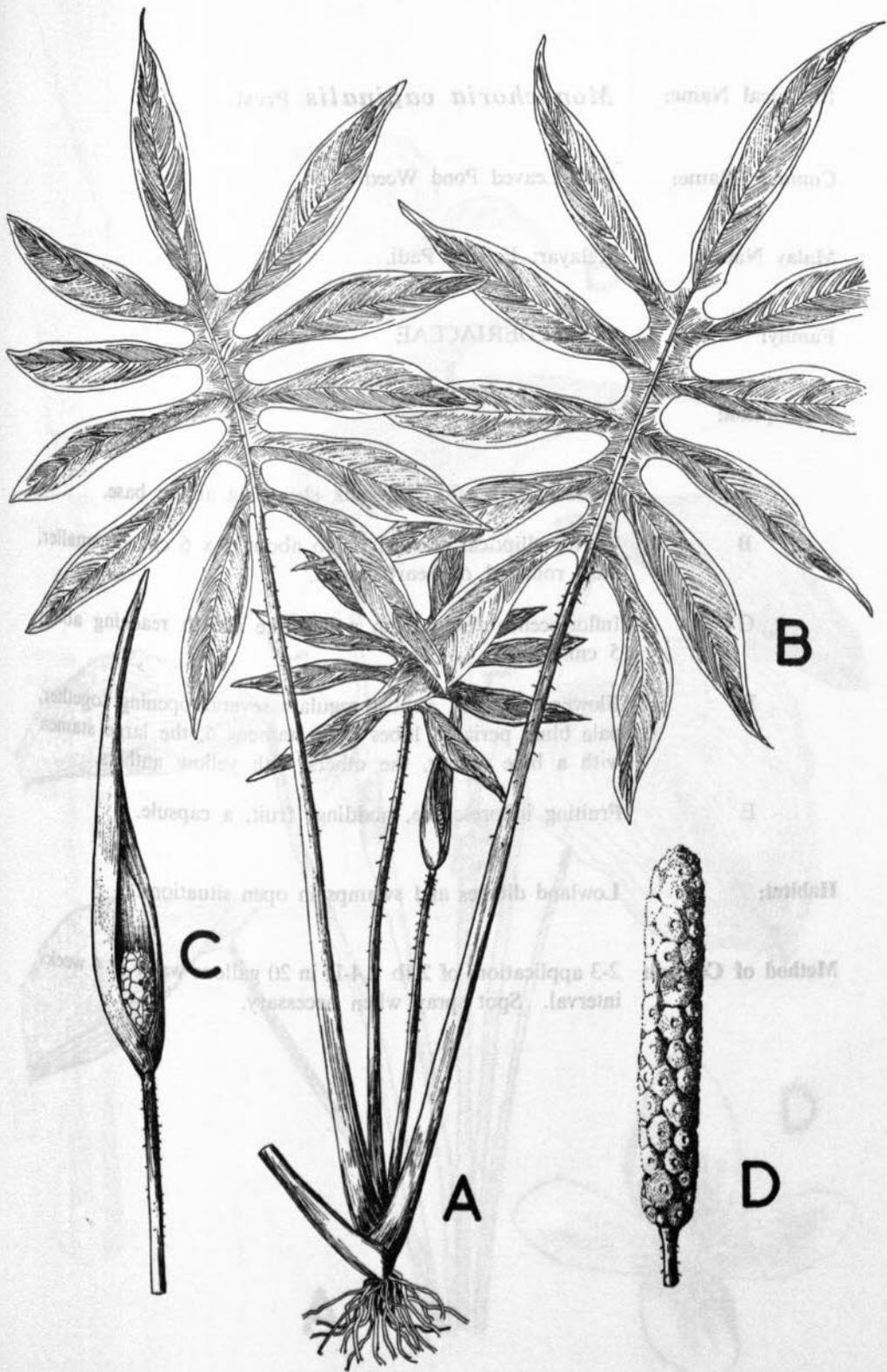
Family: ARACEAE

Description:

- A Stem stout and prickly.
- B Leaves more than 30 cm. long and wide; leaf-blade deeply cut into 4-8 pairs of narrow oblong lobes, those at the base pointing downwards and usually again lobed, leaf-stalk and veins on the under surface of blade with strong thorns.
- C Inflorescence arise from the base, about 30 cm. long, stalk thorny; spathe about 40 cm. long and narrow, greenish outside and brown-purplish inside, opening only at the swollen base; flowers bisexual, closely crowded on the short spadix
- D Fruiting spadix with thick, green quadrangular fruits crowded together and having flat, rough tops.

Habitat: In swampy and marshy places.

Method of Control: 2-3 repeated applications at 4 weekly intervals of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water.



Botanical Name: *Monochoria vaginalis* Presl.

Common Name: Oval-Leaved Pond Weed

Malay Name: Kelayar; Echeng Padi.

Family: PONTEDERIACEAE

Description:

- A Aquatic herb with leaf-stalk sheathing at the base.
- B Leaves elliptical or oval up to about 8 x 6 cm. or smaller, base rounded or heart-shaped.
- C Inflorescence rising from a leaf-like sheath reaching about 5 cm. long.
- D Flowers bisexual, almost regular several opening together, pale blue; perianth lobes free; stamens 6, the large stamen with a blue anther, the others with yellow anthers.
- E Fruiting inflorescence, nodding; fruit, a capsule.

Habitat: Lowland ditches and swamps in open situations

Method of Control: 2-3 applications of 2 lb 2,4-D in 20 gallons water at 4 weeks interval. Spot spray when necessary.

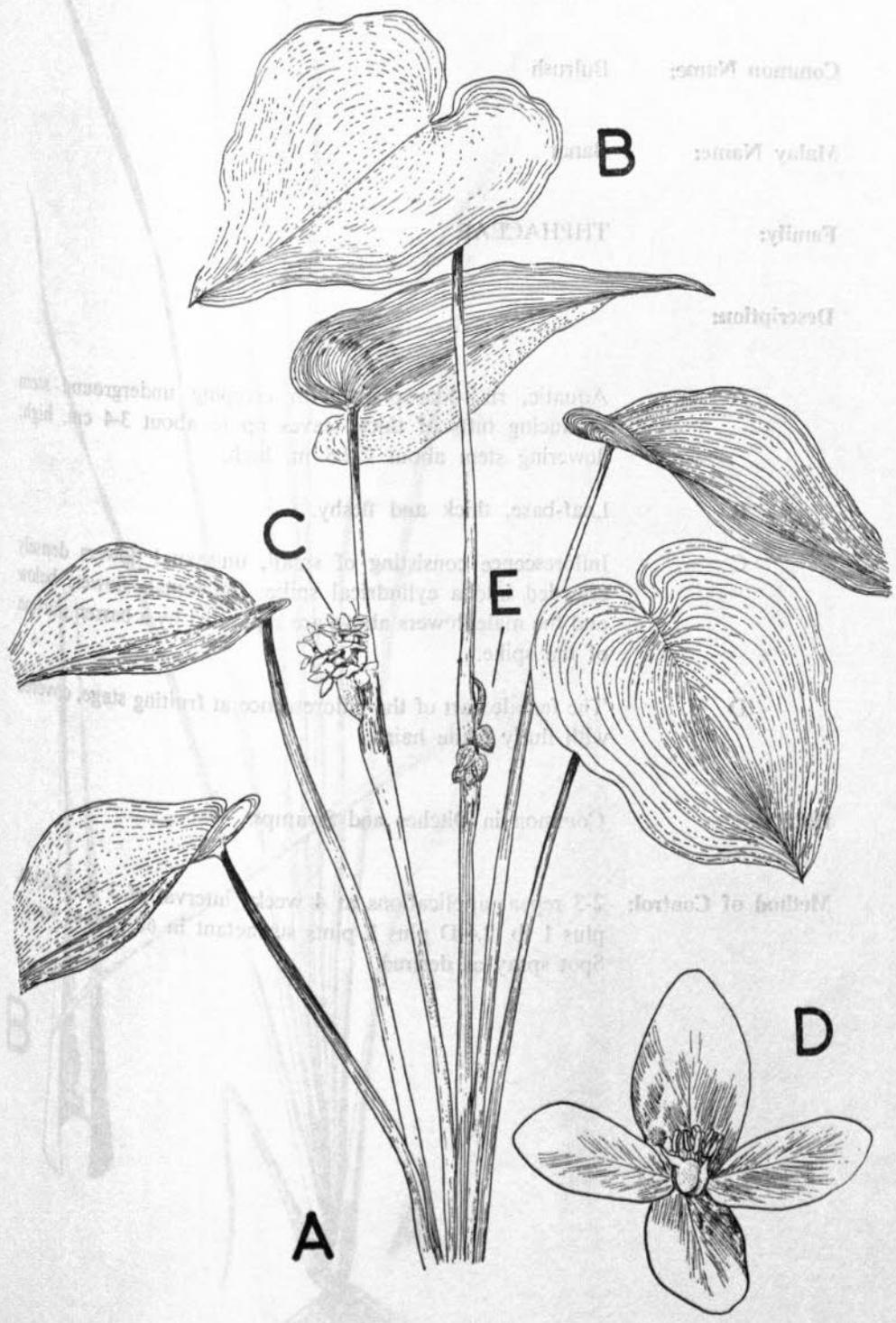
Botanical Name: *Thypha angustata* (L.) Kunt.

Common Name: Bulrush

State Name:

Family: THALASSIUM

Description:



Botanical Name: *Typha angustata* Bory & Chaub.

Common Name: Bulrush

Malay Name: Banat

Family: THPHACEAE

Description:

A Aquatic, rush-like plant with creeping underground stem producing tufts of thick leaves up to about 3-4 cm. high; flowering stem about 2-2.5 m. high.

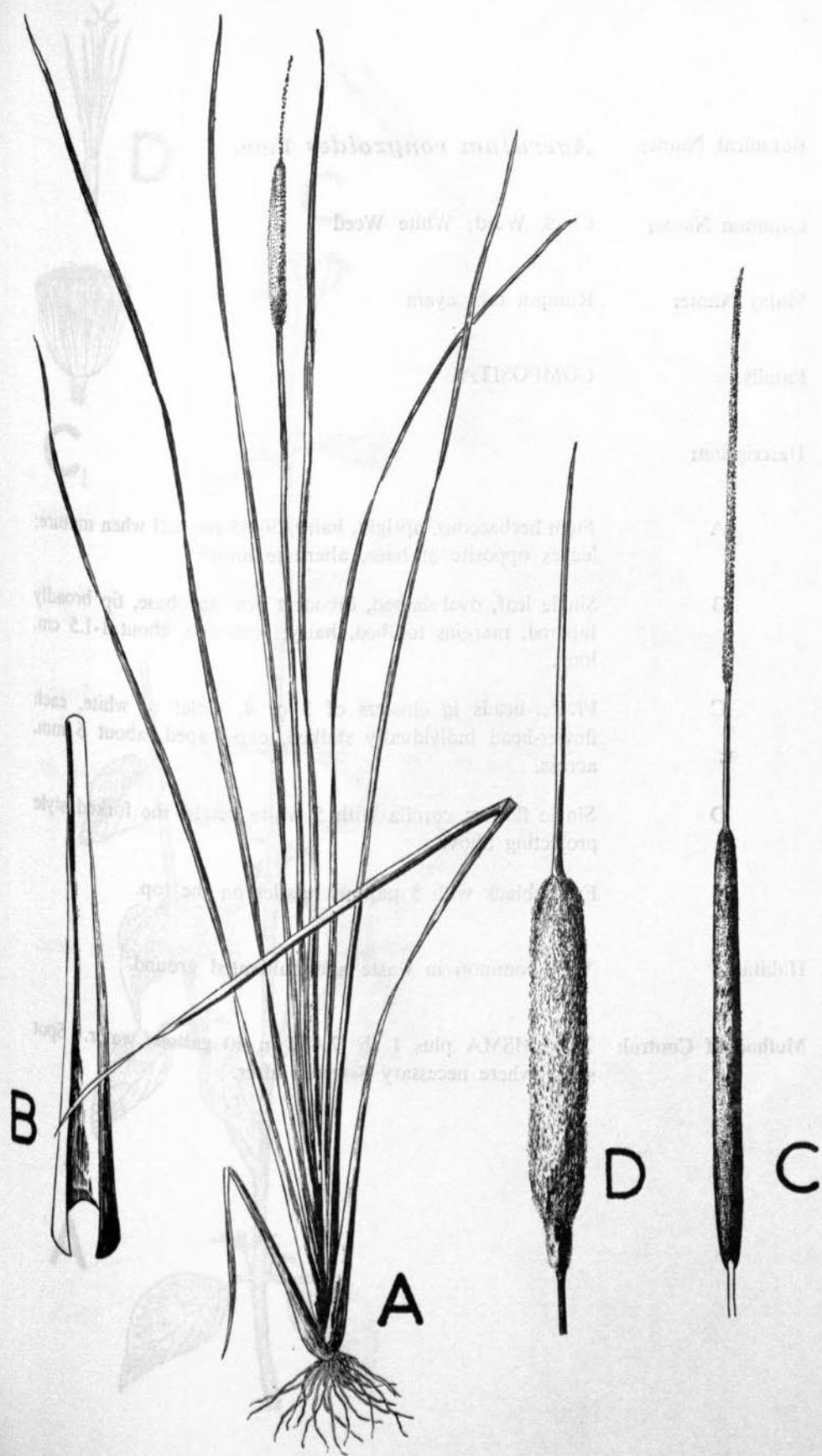
B Leaf-base, thick and fleshy.

C Inflorescence consisting of small, unisexual flowers densely crowded into a cylindrical spike; the female flowers below and the male flowers above are separated by a barren portion of the spike.

D The female part of the inflorescence at fruiting stage, covered with fluffy white hairs.

Habitat: Common in Ditches and Swamps.

Method of Control: 2-3 repeat applications at 4 weeks interval of 3 lb MSMA plus 1 lb 2,4-D plus 2 pints surfactant in 60 gallons water. Spot spray as desired.



Botanical Name: *Ageratum conyzoides* Linn.

Common Name: Chick Weed; White Weed

Malay Name: Rumput tahi ayam

Family: COMPOSITAE

Description:

A Stem herbaceous, upright, hairy, 30-45 cm. tall when mature; leaves opposite at base, alternate above.

B Single leaf, oval-shaped, broadest near the base, tip broadly tapered, margins toothed, hairy; leafstalks about 1-1.5 cm. long.

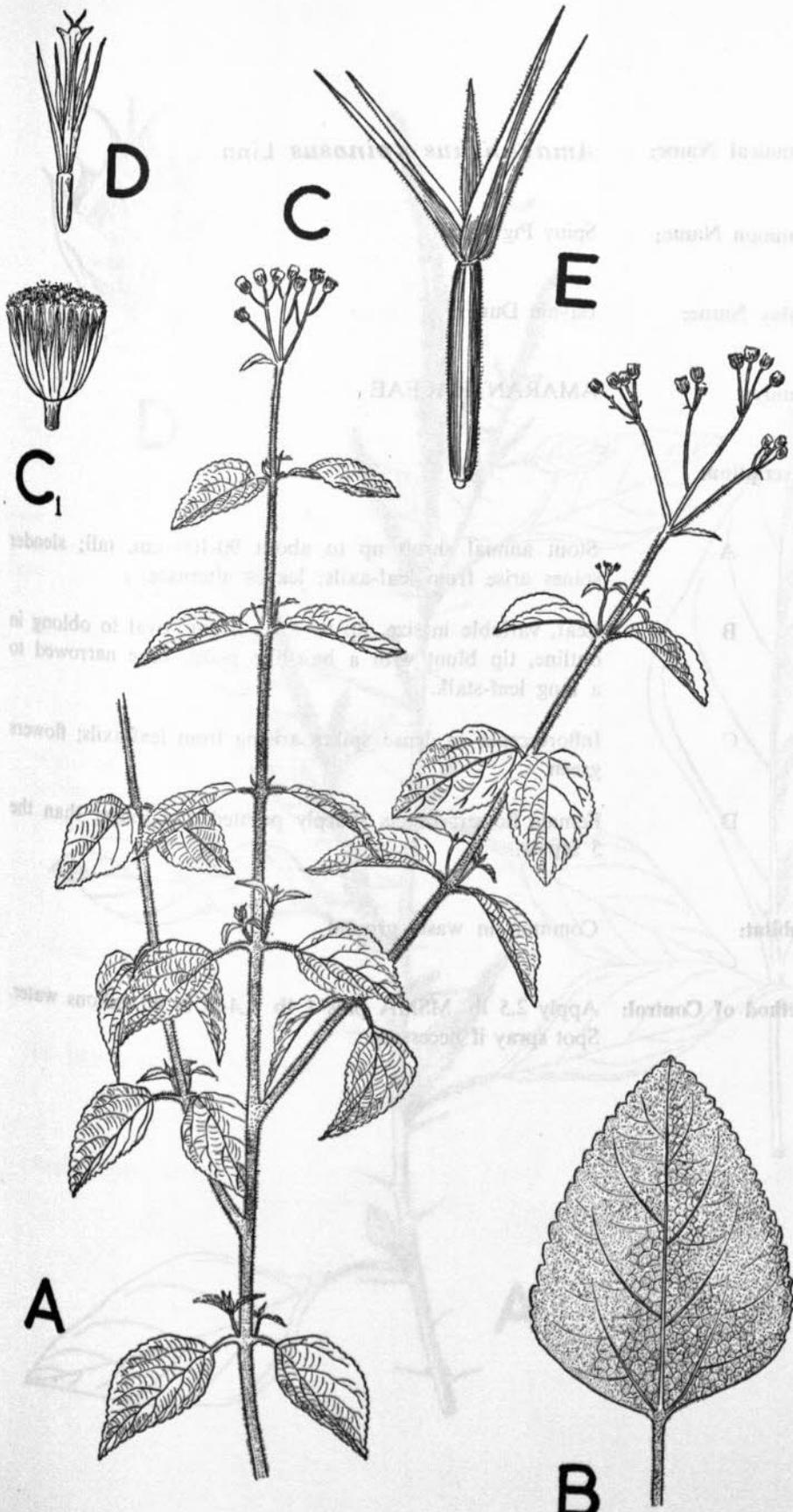
C Flower-heads in clusters of 3 or 4, violet or white, each flower-head individually stalked, cup-shaped, about 6 mm. across.

D Single flower; corolla with 5 white petals, the forked style projecting above.

E Fruit, black with 5 pappus bristles on the top.

Habitat: Very common in waste and cultivated ground.

Method of Control: 2 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray where necessary 5 weeks after.



Botanical Name: *Amaranthus spinosus* Linn.

Common Name: Spiny Pig Weed

Malay Name: Bayam Duri

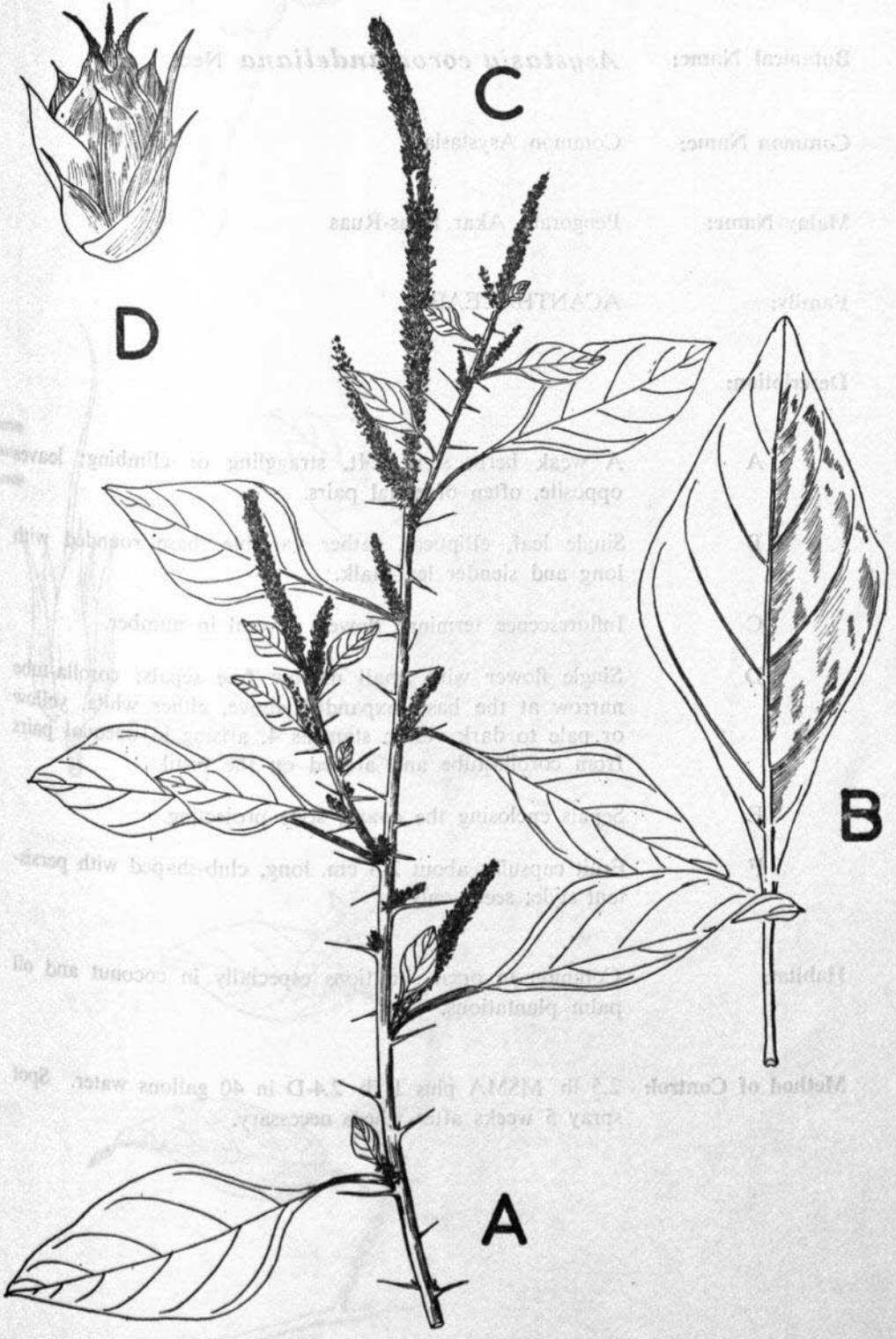
Family: AMARANTHACEAE

Description:

- A Stout annual shrub up to about 90-100 cm. tall; slender spines arise from leaf-axils; leaves alternate.
- B Leaf, variable in size, up to 7.5 x 4 cm., oval to oblong in outline, tip blunt with a hair-like point, base narrowed to a long leaf-stalk.
- C Inflorescence in dense spikes arising from leaf-axils; flowers green.
- D Female flower; bracts sharply pointed and longer than the 5 sepals.

Habitat: Common in waste ground.

Method of Control: Apply 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray if necessary.



C

D

B

A

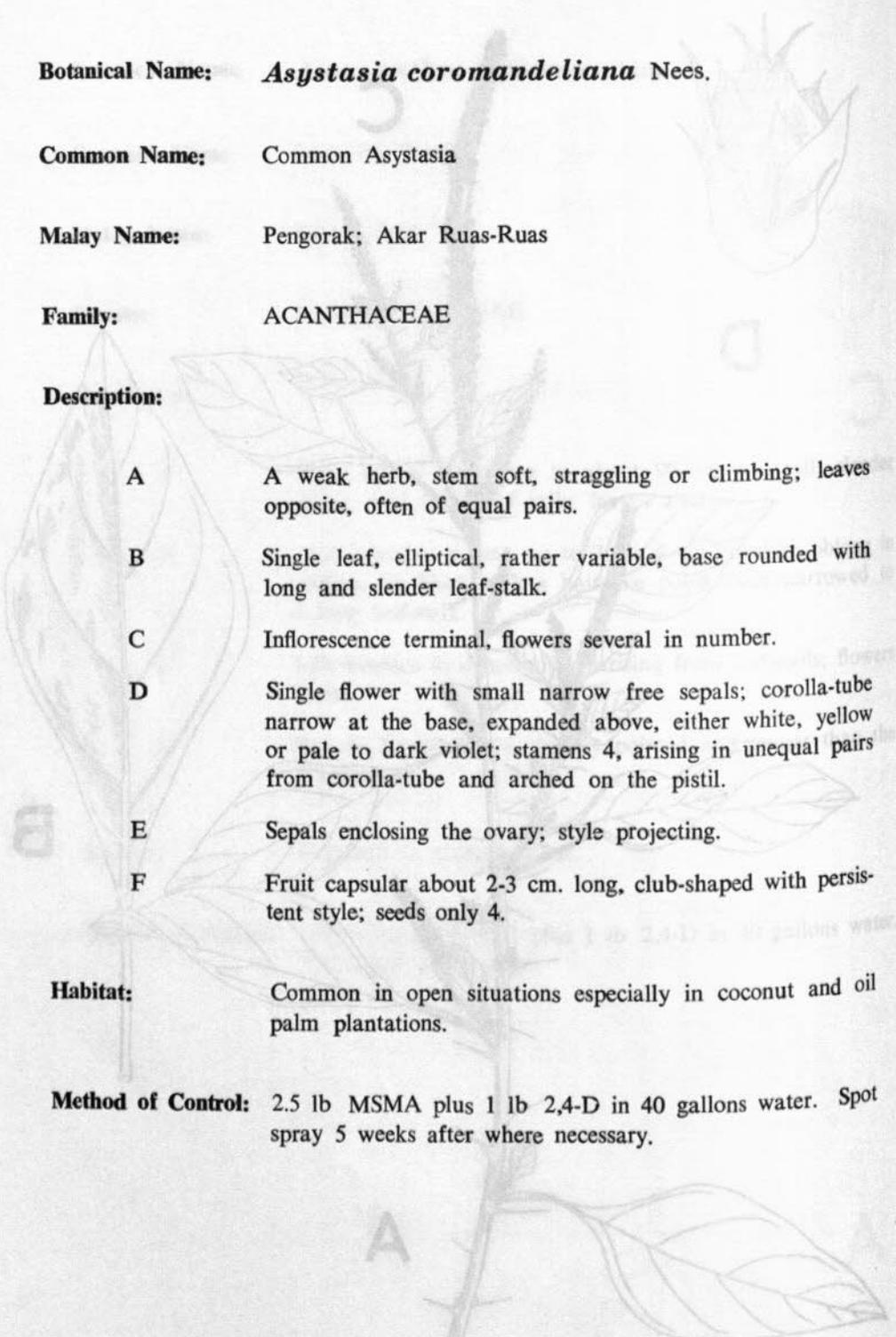
Botanical Name: *Asystasia coromandeliana* Nees.

Common Name: Common Asystasia

Malay Name: Pengorak; Akar Ruas-Ruas

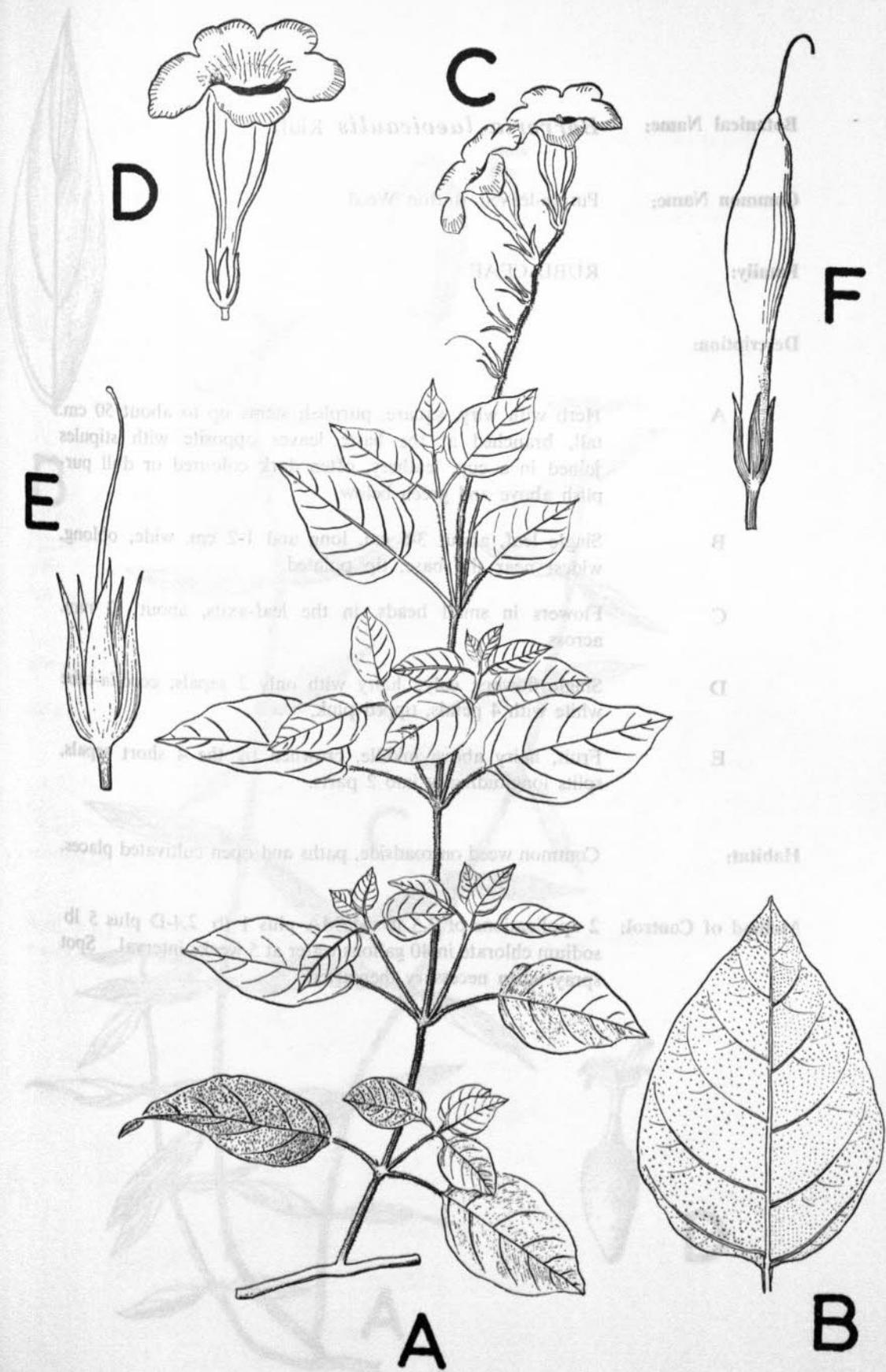
Family: ACANTHACEAE

Description:

- 
- A A weak herb, stem soft, straggling or climbing; leaves opposite, often of equal pairs.
- B Single leaf, elliptical, rather variable, base rounded with long and slender leaf-stalk.
- C Inflorescence terminal, flowers several in number.
- D Single flower with small narrow free sepals; corolla-tube narrow at the base, expanded above, either white, yellow or pale to dark violet; stamens 4, arising in unequal pairs from corolla-tube and arched on the pistil.
- E Sepals enclosing the ovary; style projecting.
- F Fruit capsular about 2-3 cm. long, club-shaped with persistent style; seeds only 4.

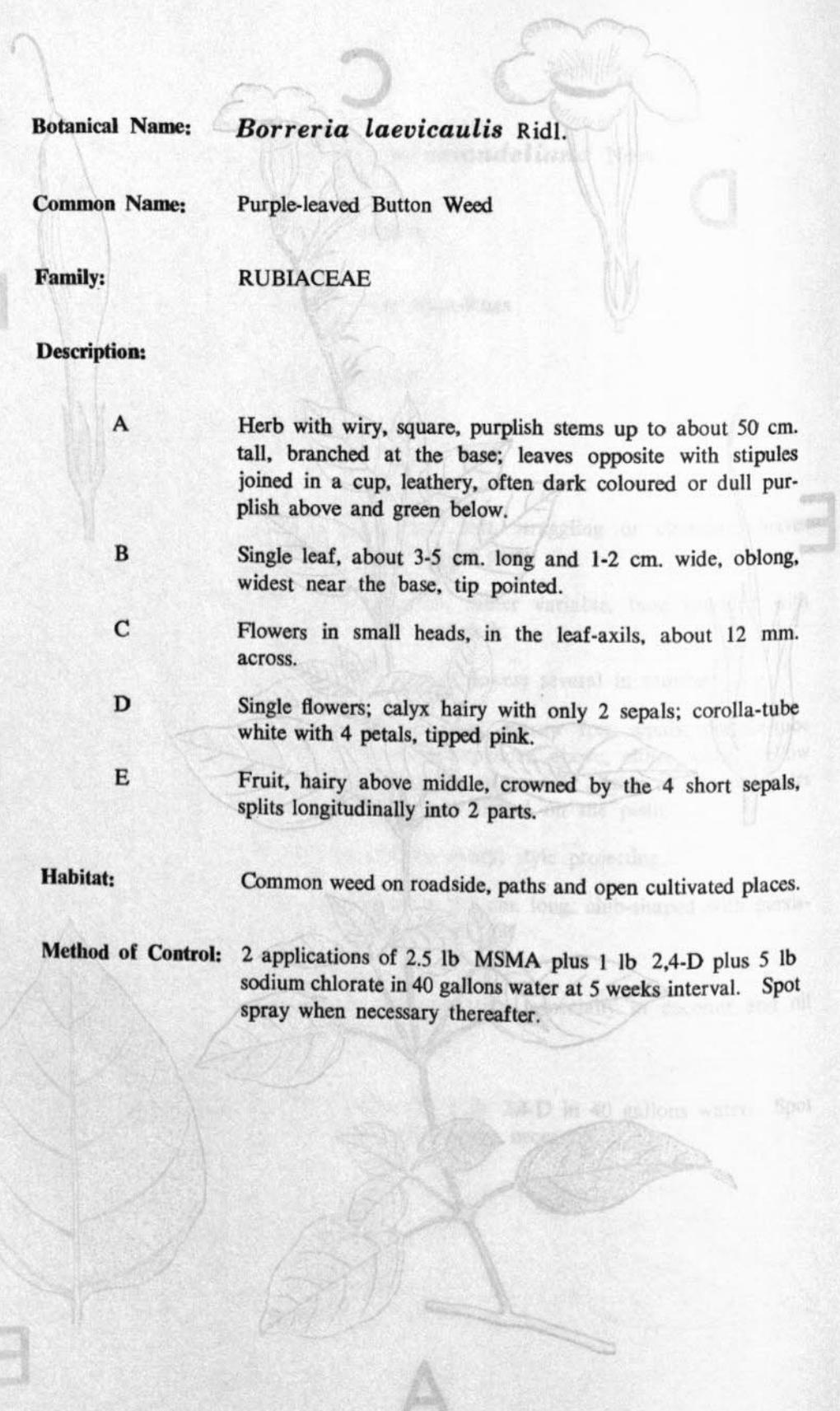
Habitat: Common in open situations especially in coconut and oil palm plantations.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks after where necessary.



A

B



Botanical Name: *Borreria laevicaulis* Ridl.

Common Name: Purple-leaved Button Weed

Family: RUBIACEAE

Description:

- A Herb with wiry, square, purplish stems up to about 50 cm. tall, branched at the base; leaves opposite with stipules joined in a cup, leathery, often dark coloured or dull purplish above and green below.
- B Single leaf, about 3-5 cm. long and 1-2 cm. wide, oblong, widest near the base, tip pointed.
- C Flowers in small heads, in the leaf-axils, about 12 mm. across.
- D Single flowers; calyx hairy with only 2 sepals; corolla-tube white with 4 petals, tipped pink.
- E Fruit, hairy above middle, crowned by the 4 short sepals, splits longitudinally into 2 parts.

Habitat: Common weed on roadside, paths and open cultivated places.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.

Botanical Name: *Borreria latifolia* Schum.

Common Name: Broadleaf-Button Weed; Garden Weed

Malay Name: Rumput setawar

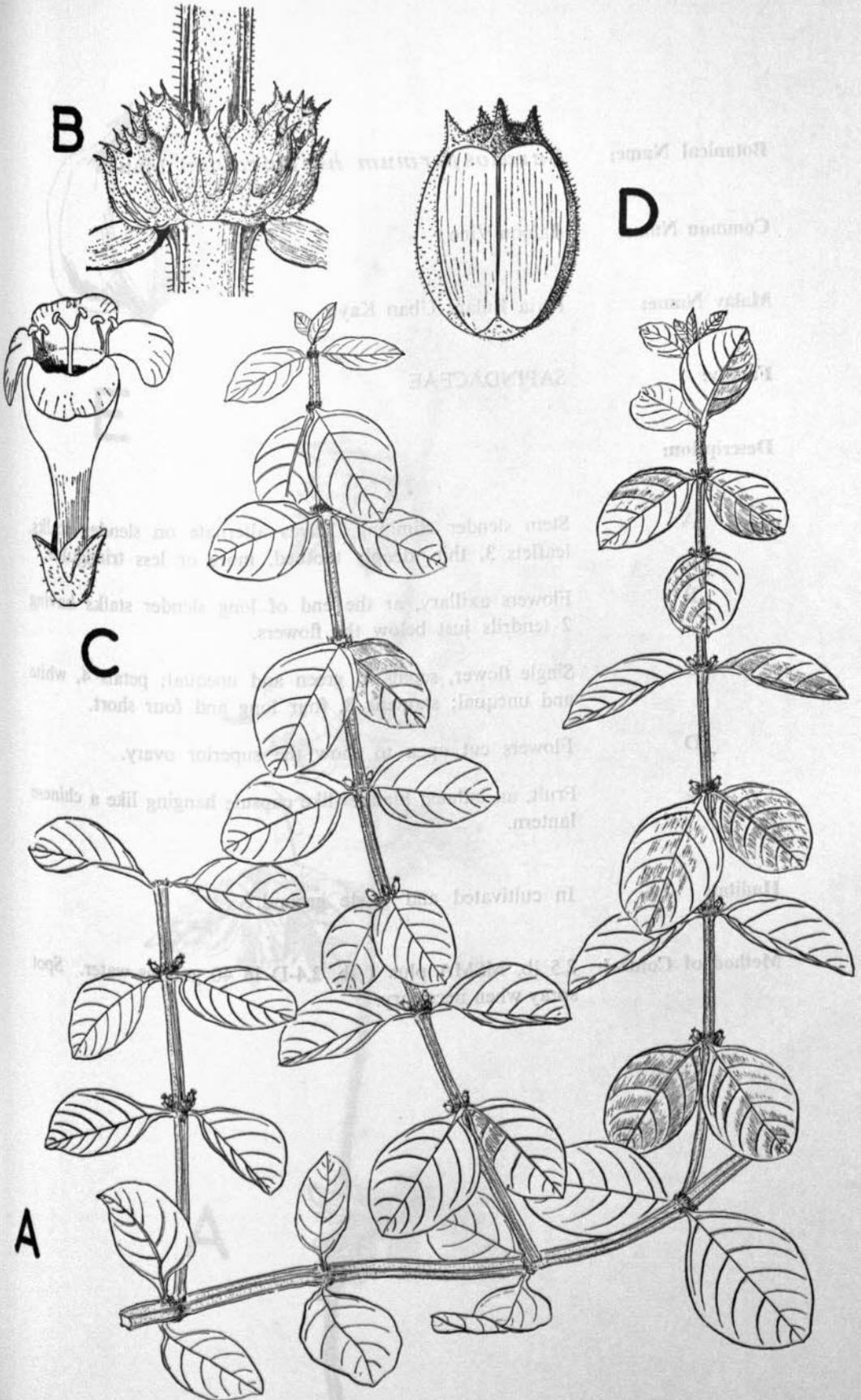
Family: RUBIACEAE

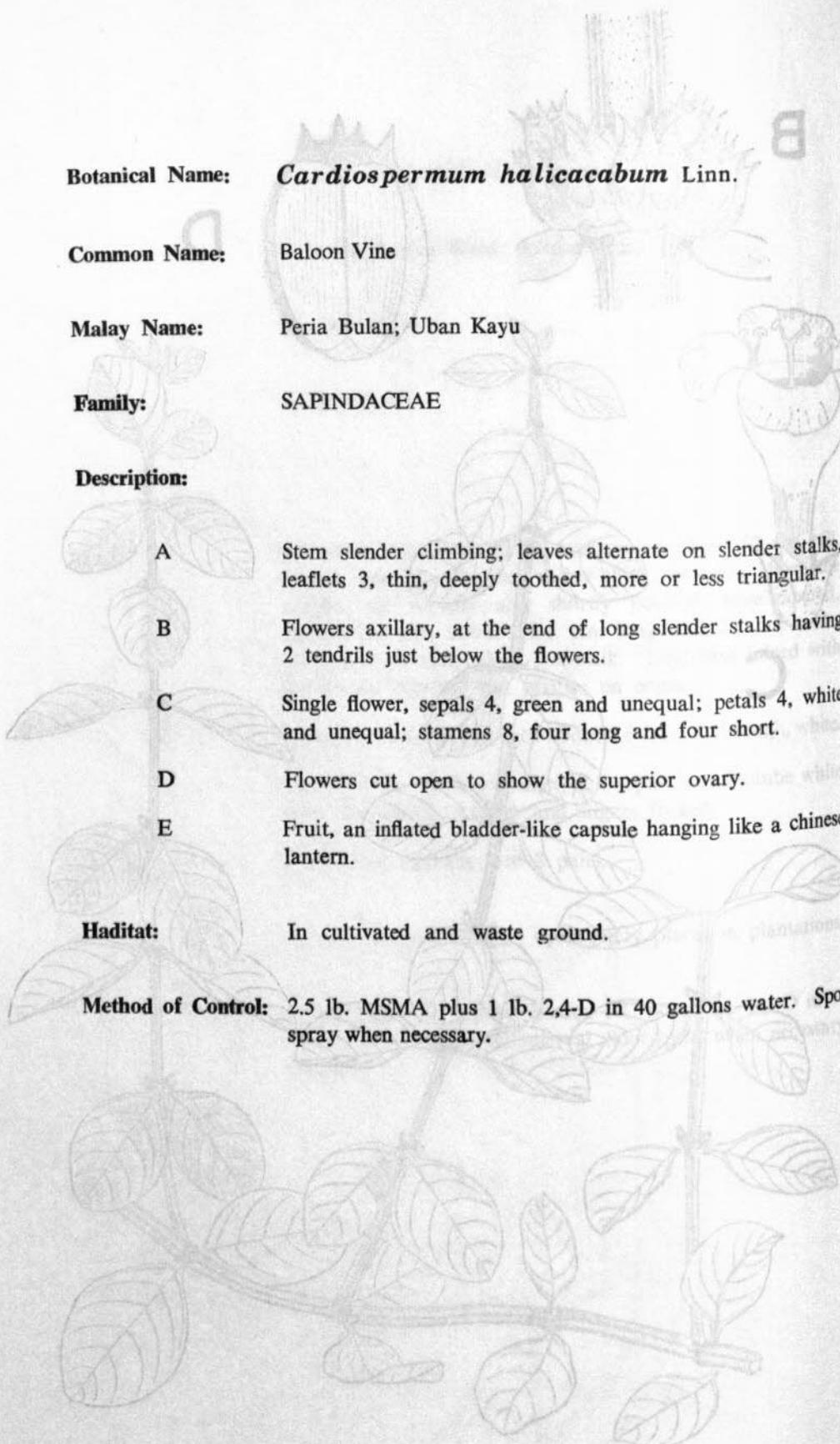
Description:

- A Branched herb; stem fleshy, rectangular, about 60 cm. tall. Leaves opposite, elliptical, rather thick, broadest above the middle, tip broadly and shortly pointed, base tapered, variable in size, about 2.5-5 cm. long and 2.5 cm. wide, hairy on both sides, short leaf-stalk. Leaf-base joined with cup-shaped stipules with bristles on edges.
- B Flower heads from leaf-axils about 0.6-1.2 cm. through, white.
- C Single flower with hairy calyx of 4 sepals, corolla-tube white with lilac petals; stamens and stigma forked.
- D Fruit hairy, splitting into 2 pairs.

Habitat: A very common weed in open sandy places in plantations.

Method of Control: 2 applications of 3 pints Sordox HC plus 1 pt 2,4-D in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.





Botanical Name: *Cardiospermum halicacabum* Linn.

Common Name: Baloon Vine

Malay Name: Peria Bulan; Uban Kayu

Family: SAPINDACEAE

Description:

- A Stem slender climbing; leaves alternate on slender stalks, leaflets 3, thin, deeply toothed, more or less triangular.
- B Flowers axillary, at the end of long slender stalks having 2 tendrils just below the flowers.
- C Single flower, sepals 4, green and unequal; petals 4, white and unequal; stamens 8, four long and four short.
- D Flowers cut open to show the superior ovary.
- E Fruit, an inflated bladder-like capsule hanging like a chinese lantern.

Habitat: In cultivated and waste ground.

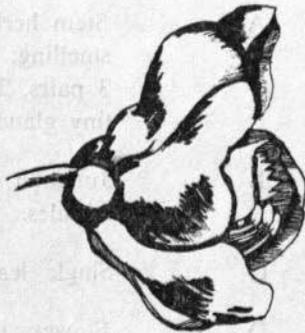
Method of Control: 2.5 lb. MSMA plus 1 lb. 2,4-D in 40 gallons water. Spot spray when necessary.



E



A



C



D

B

Botanical Name: *Cassia tora* Linn.

Common Name: Foetid Cassia

Malay Name: Gelenggang ketchil

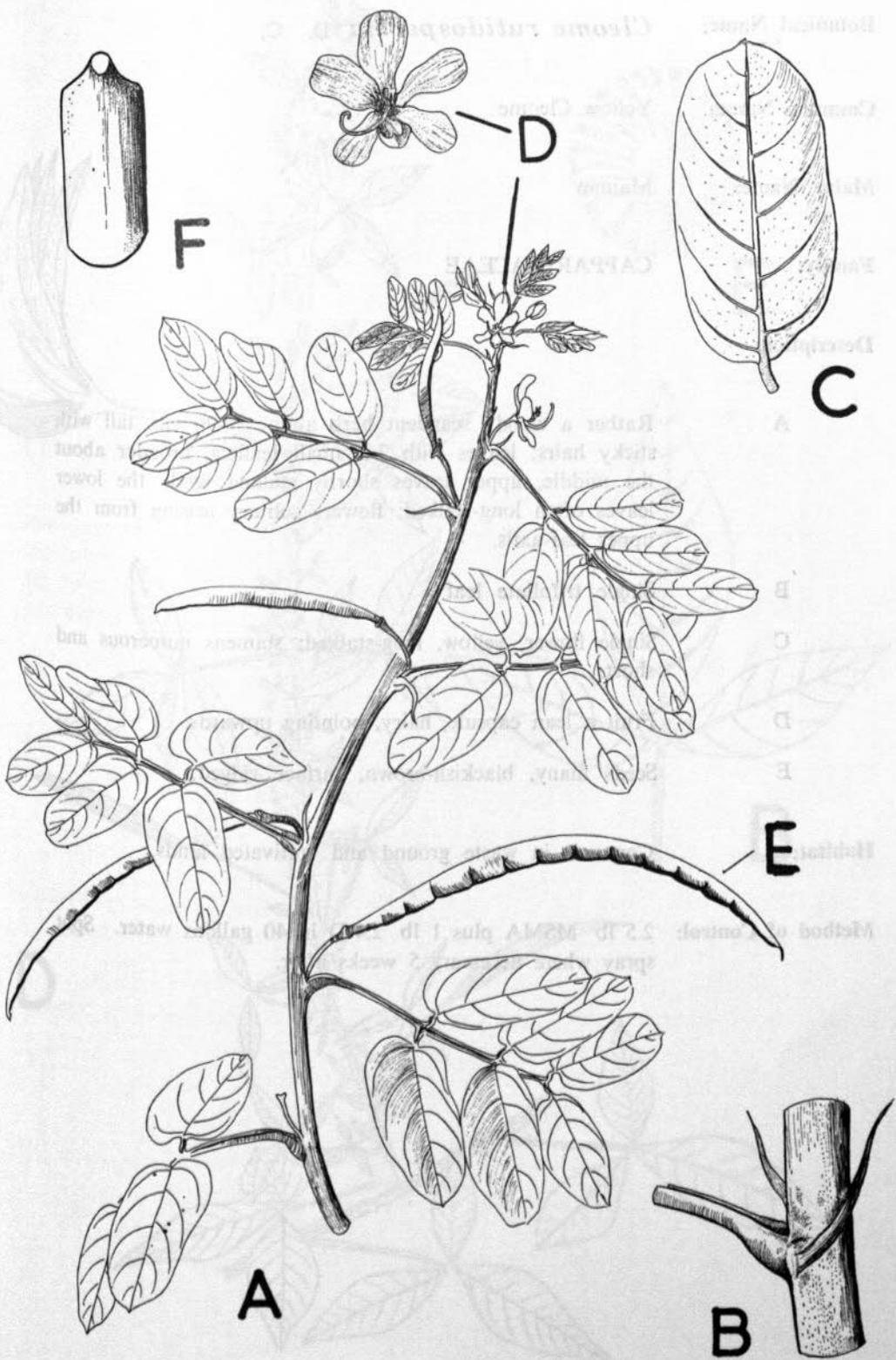
Family: LEGUMINOSAE

Description:

- A Stem herbaceous to woody up to about 150 cm. tall, foul smelling; leaves alternate, pinnate, leaflets often ending in 3 pairs, 2.5-5 cm. long and 1-2.5 cm. wide; leaf-stalk with tiny glands and grooved on the upper side.
- B Junction of leaf-stalk with the stem marked by a pair of stipules.
- C Single leaf, broadest above the middle, tip rounded.
- D Flowers in pairs from leaf-axils, bright yellow; calyx with a short tube; petals 5; stamens 10, the 3 upper shorter ones not fully developed, the lower ones with thick stalks; style long curved.
- E The pod, sickle shaped, many seeded, with partition between seeds.
- F Seed, rectangular with the hilum at one end.

Habitat: Common in waste ground.

Method of Control: 2 applications at 4-5 weeks interval of 2 lb 2,4-D in 40 gallons water.



Botanical Name: *Cleome rutidosperma* D. C.

Common Name: Yellow Cleome

Malay Name: Maman

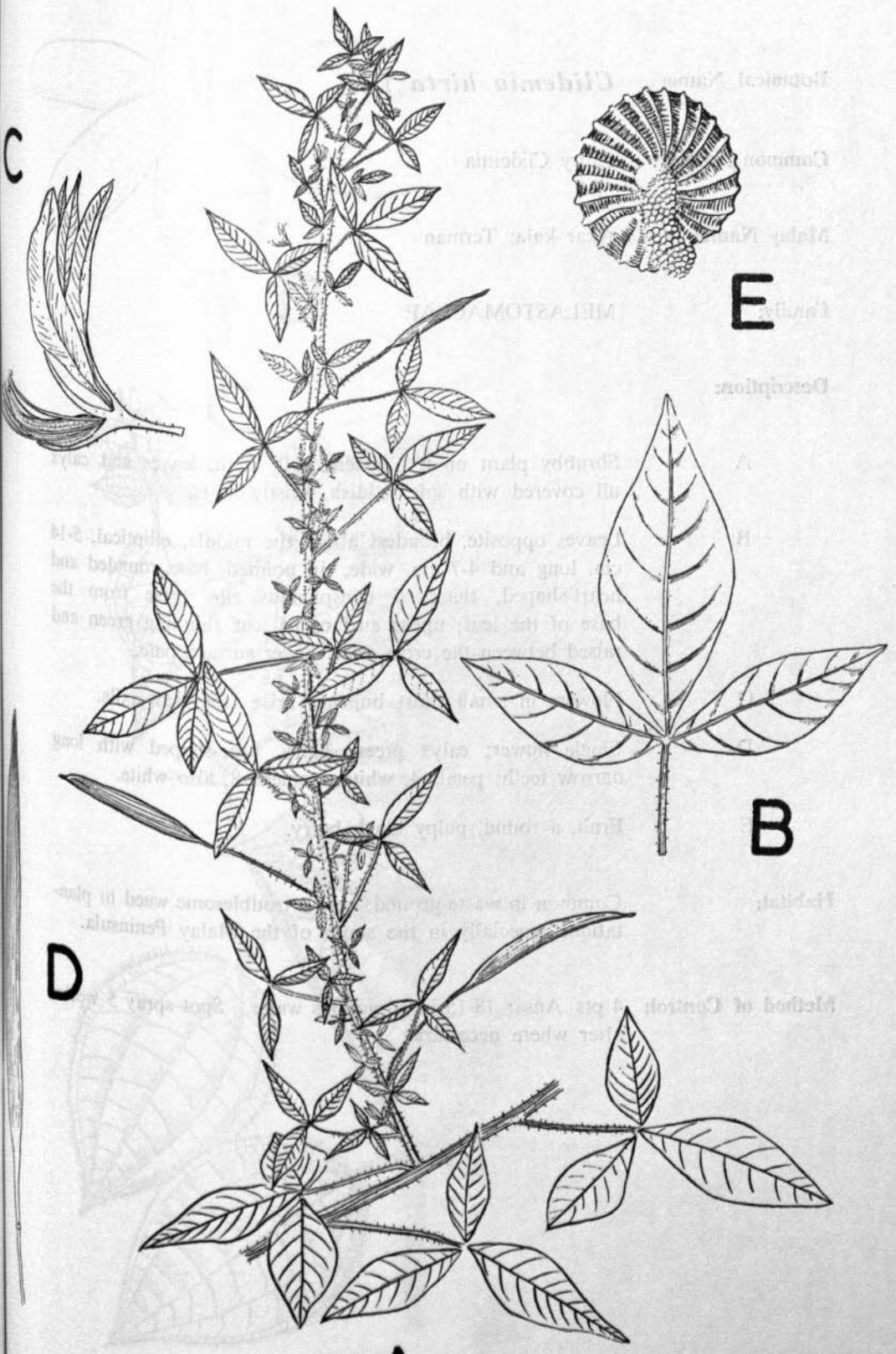
Family: CAPPARIDACEAE

Description:

- A Rather a woody scandent herb about 30-90 cm. tall with sticky hairs; leaves with 3-5 small leaflets, broader about the middle, upper leaves shortly stalked while the lower leaves often long-stalked; flowers solitary arising from the upper leaf-axils.
- B Single trifoliate leaf.
- C Single flower, yellow, long-stalked; stamens numerous and short.
- D Fruit a lean capsule, hairy, pointing upwards.
- E Seeds many, blackish-brown, surface ridged.

Habitat: Common in waste ground and cultivated lands.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray where necessary 5 weeks after.



C

E

B

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A

Botanical Name: *Clidemia hirta* Don.

Common Name: Hairy Clidemia

Malay Name: Akar kala; Terman

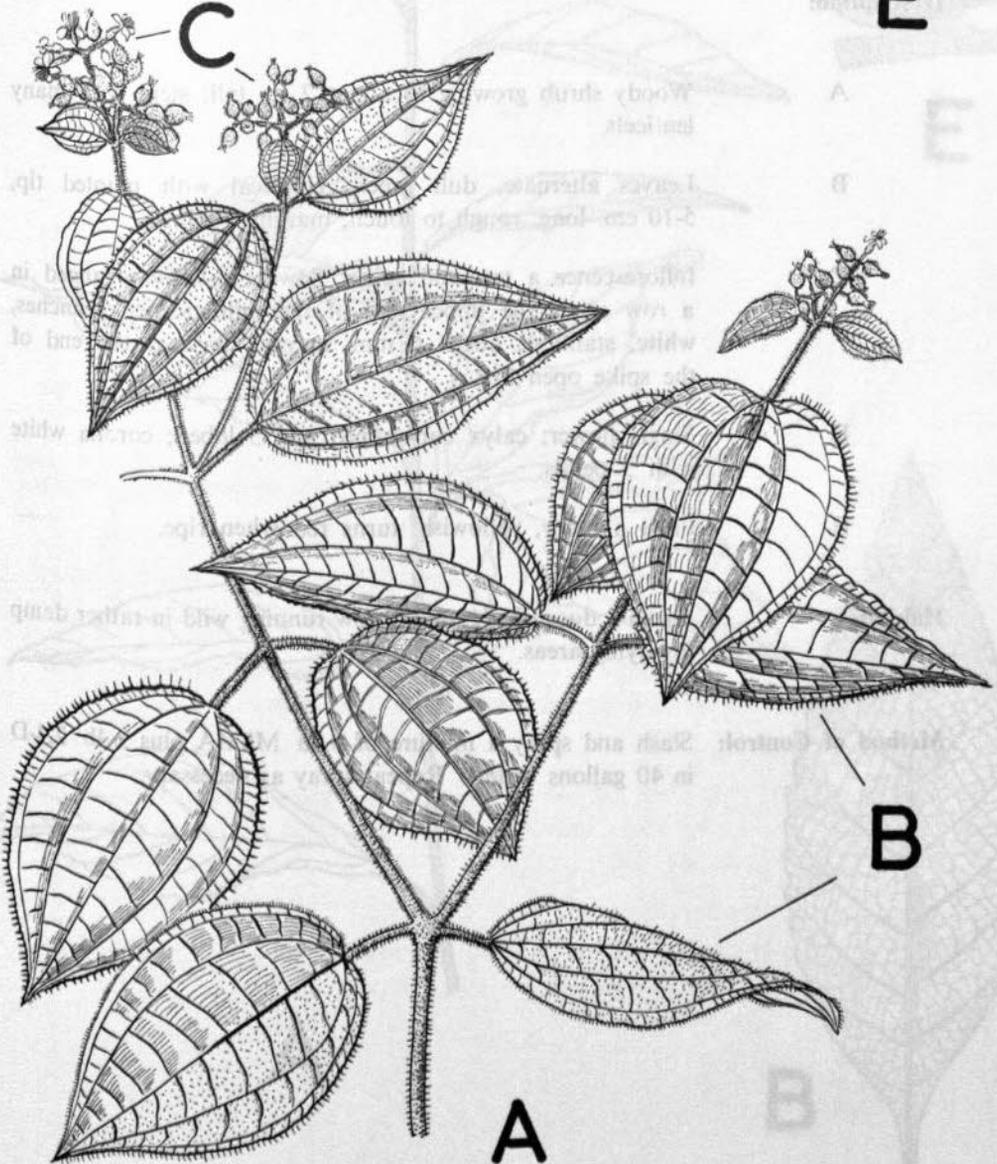
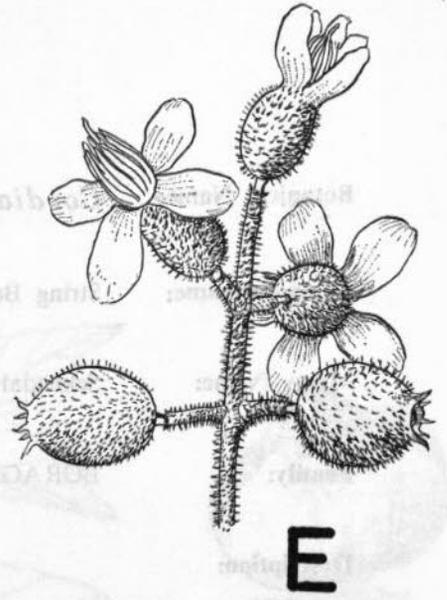
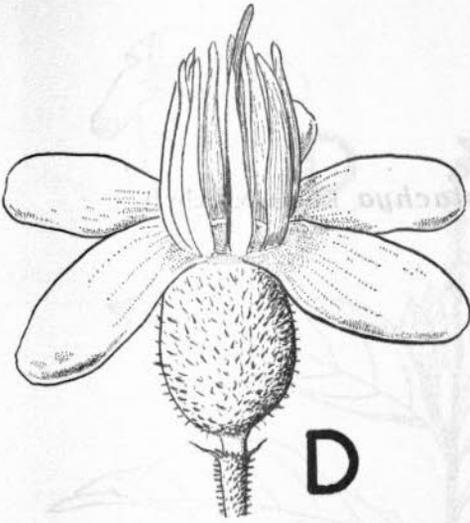
Family: MELASTOMACEAE

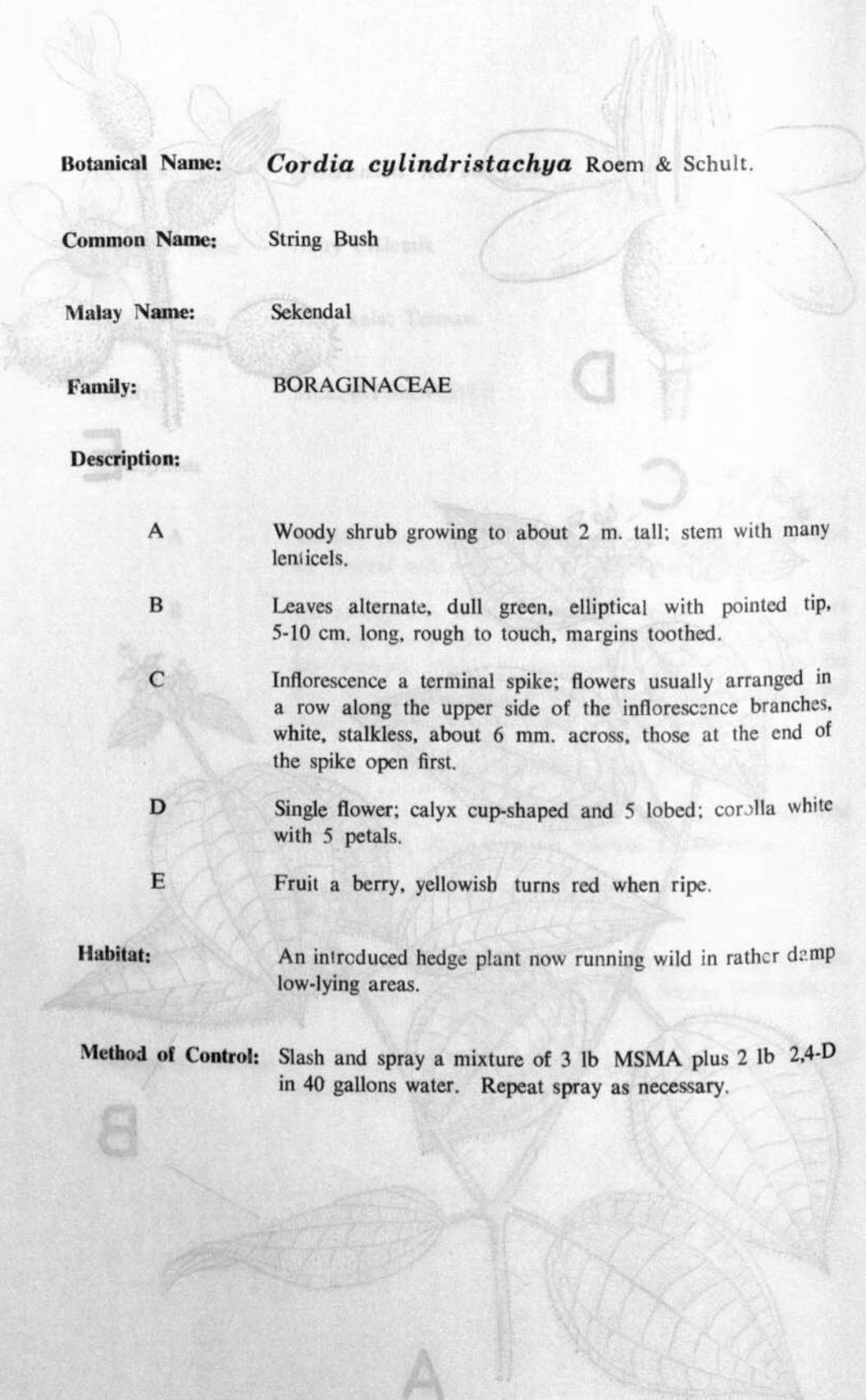
Description:

- A Shrubby plant up to 200 cm. tall; stem, leaves and calyx all covered with soft reddish, bristly hairs.
- B Leaves opposite, broadest about the middle, elliptical, 5-14 cm. long and 4-7 cm. wide, tip pointed, base rounded and heart-shaped, thick; 5 conspicuous ribs arise from the base of the leaf; upper surface of leaf shining green and raised between the cross veins lower surface pale.
- C Flowers in small short bunches arise from leaf-axils.
- D Single flower; calyx green, hairy, tube-shaped with long narrow teeth; petals 4, white; stemens 8, also white.
- E Fruit, a round, pulpy black berry.

Habitat: Common in waste ground, now a troublesome weed in plantations especially in the south of the Malay Peninsula.

Method of Control: 4 pts Ansar 18-15 in 40 gallons water. Spot spray 5 weeks after where necessary.





Botanical Name: *Cordia cylindristachya* Roem & Schult.

Common Name: String Bush

Malay Name: Sekendal

Family: BORAGINACEAE

Description:

A Woody shrub growing to about 2 m. tall; stem with many lenticels.

B Leaves alternate, dull green, elliptical with pointed tip, 5-10 cm. long, rough to touch, margins toothed.

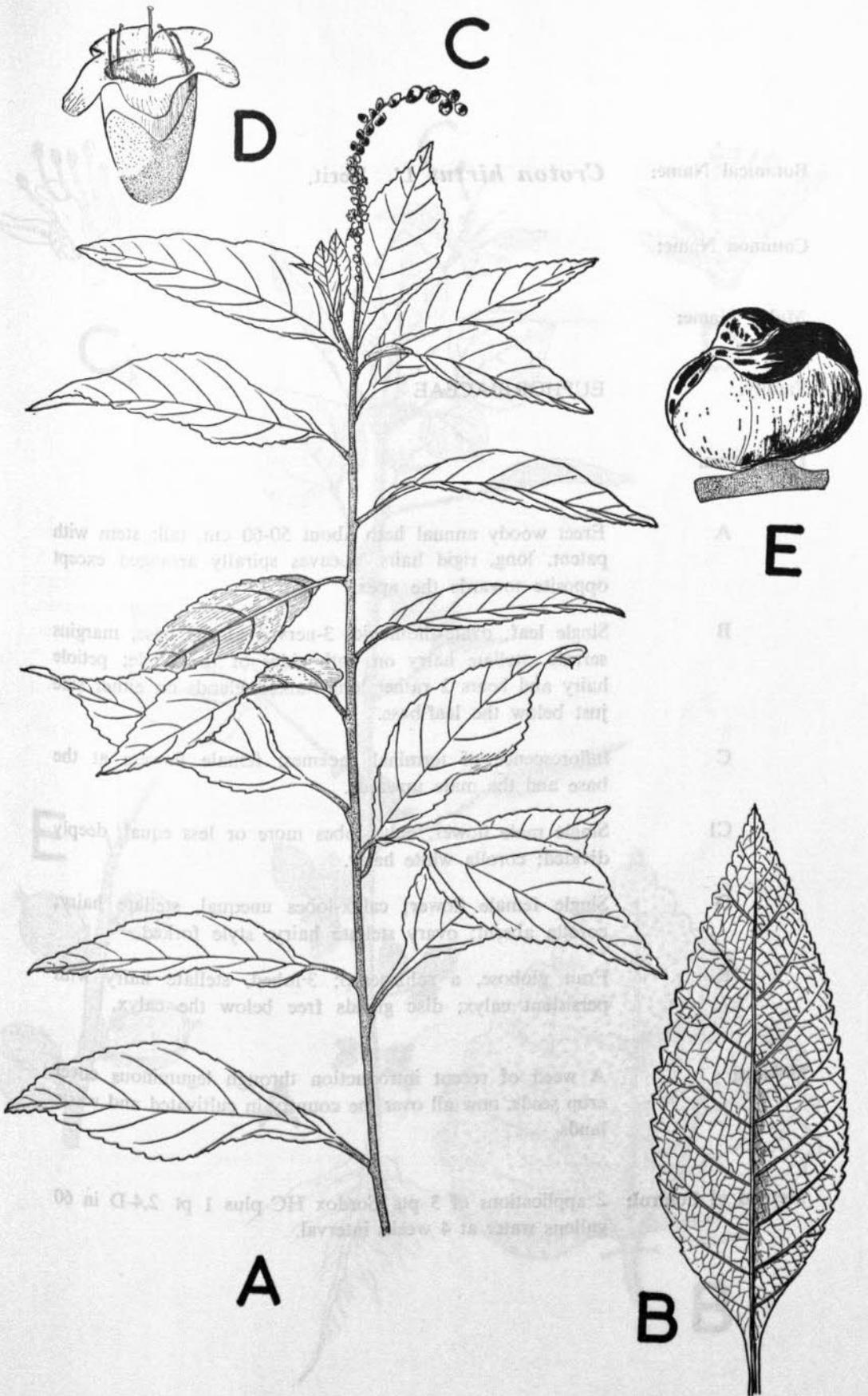
C Inflorescence a terminal spike; flowers usually arranged in a row along the upper side of the inflorescence branches, white, stalkless, about 6 mm. across, those at the end of the spike open first.

D Single flower; calyx cup-shaped and 5 lobed; corolla white with 5 petals.

E Fruit a berry, yellowish turns red when ripe.

Habitat: An introduced hedge plant now running wild in rather damp low-lying areas.

Method of Control: Slash and spray a mixture of 3 lb MSMA plus 2 lb 2,4-D in 40 gallons water. Repeat spray as necessary.



Botanical Name: *Croton hirtus* L'. Herit.

Common Name: _____

Malay Name: _____

Family: EUPHORBIACEAE

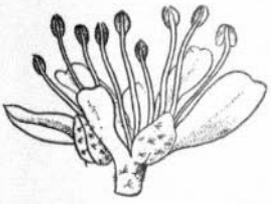
Description:

- A Erect woody annual herb about 50-60 cm. tall; stem with patent, long, rigid hairs. Leaves spirally arranged except opposite towards the apex.
- B Single leaf; ovate-rhomboid, 3-nerved at the base, margins serrate, stellate hairy on both sides of the blade; petiole hairy and bears 2 rather long-stalked glands on either side just below the leaf-base.
- C Inflorescence of terminal racemes; female flowers at the base and the male upwards.
- Cl Single male flower; calyx-lobes more or less equal, deeply divided; corolla white hairy.
- D Single female flower; calyx-lobes unequal, stellate hairy; corolla absent; ovary stellate hairy; style forked.
- E Fruit globose, a schizocarp; 3-lobed, stellate hairy with persistent calyx; disc glands free below the calyx.

Habitat:

A weed of recent introduction through leguminous cover crop seeds, now all over the country in cultivated and waste lands.

Method of Control: 2 applications of 3 pts Sordox HC plus 1 pt 2,4-D in 60 gallons water at 4 weeks interval.



C₁

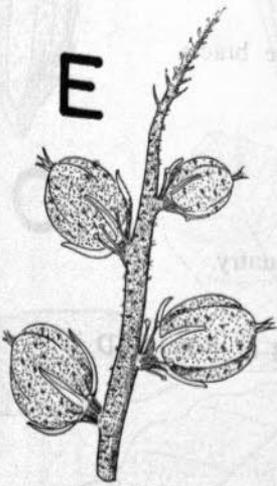


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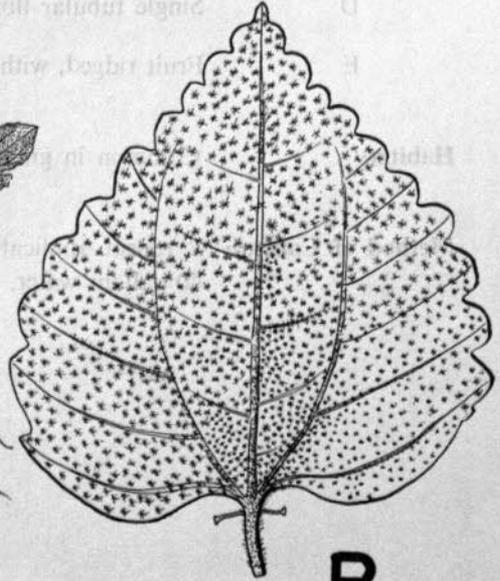
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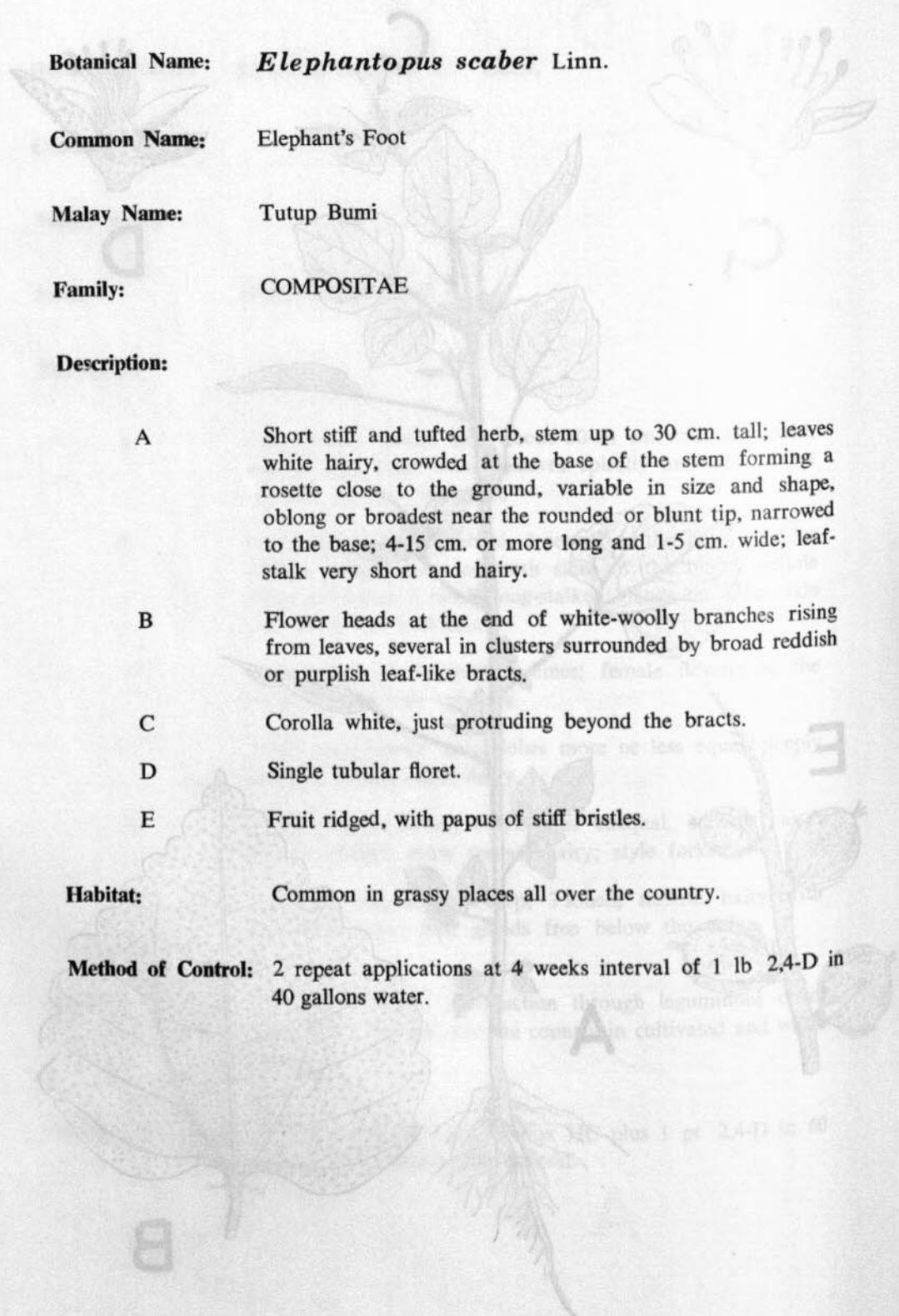
A



E



B



Botanical Name: *Elephantopus scaber* Linn.

Common Name: Elephant's Foot

Malay Name: Tutup Bumi

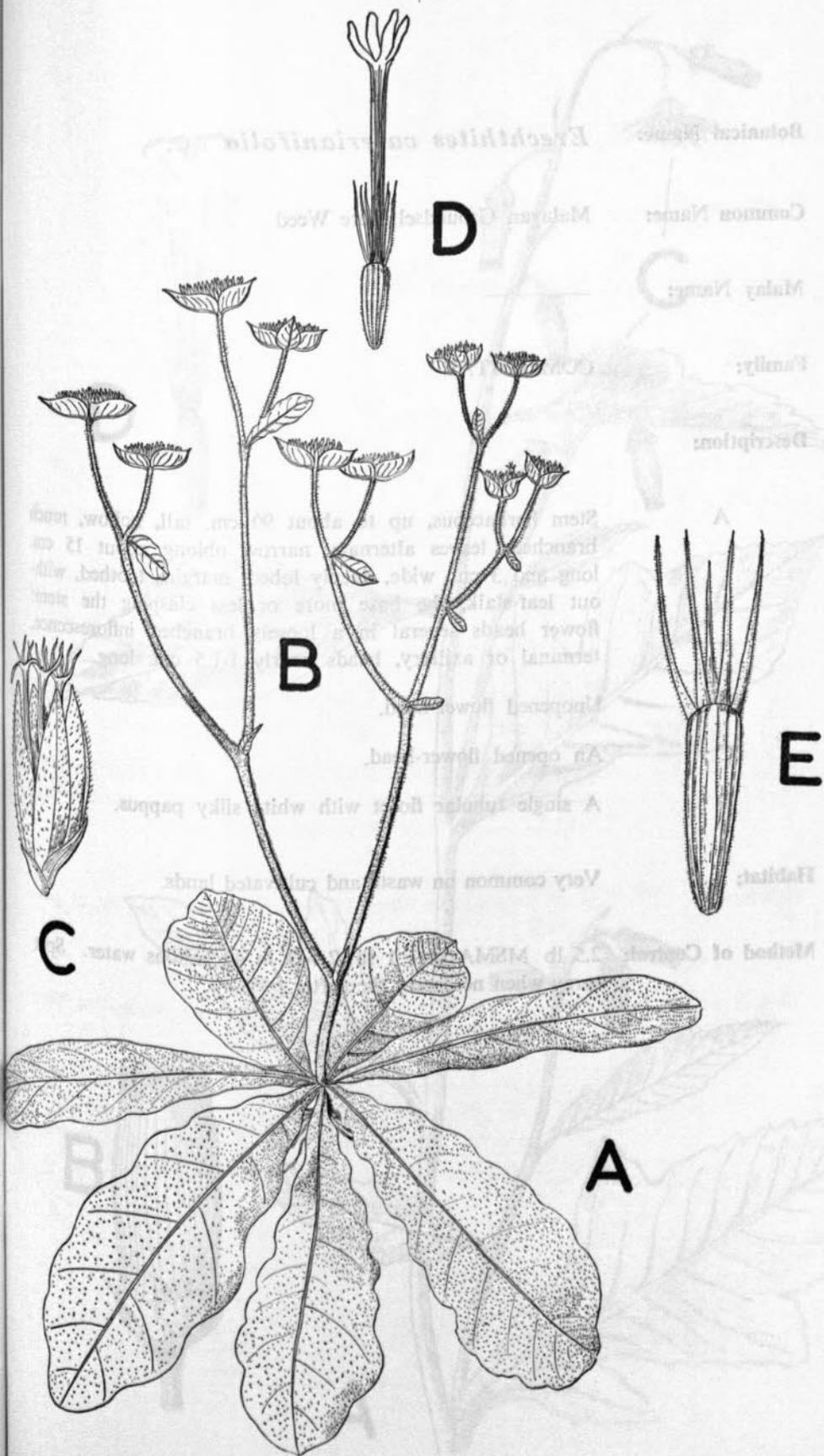
Family: COMPOSITAE

Description:

- A Short stiff and tufted herb, stem up to 30 cm. tall; leaves white hairy, crowded at the base of the stem forming a rosette close to the ground, variable in size and shape, oblong or broadest near the rounded or blunt tip, narrowed to the base; 4-15 cm. or more long and 1-5 cm. wide; leaf-stalk very short and hairy.
- B Flower heads at the end of white-woolly branches rising from leaves, several in clusters surrounded by broad reddish or purplish leaf-like bracts.
- C Corolla white, just protruding beyond the bracts.
- D Single tubular floret.
- E Fruit ridged, with papus of stiff bristles.

Habitat: Common in grassy places all over the country.

Method of Control: 2 repeat applications at 4 weeks interval of 1 lb 2,4-D in 40 gallons water.



Botanical Name: *Erechthites valerianifolia* DC.

Common Name: Malayan Groundsel; Fire Weed

Malay Name: _____

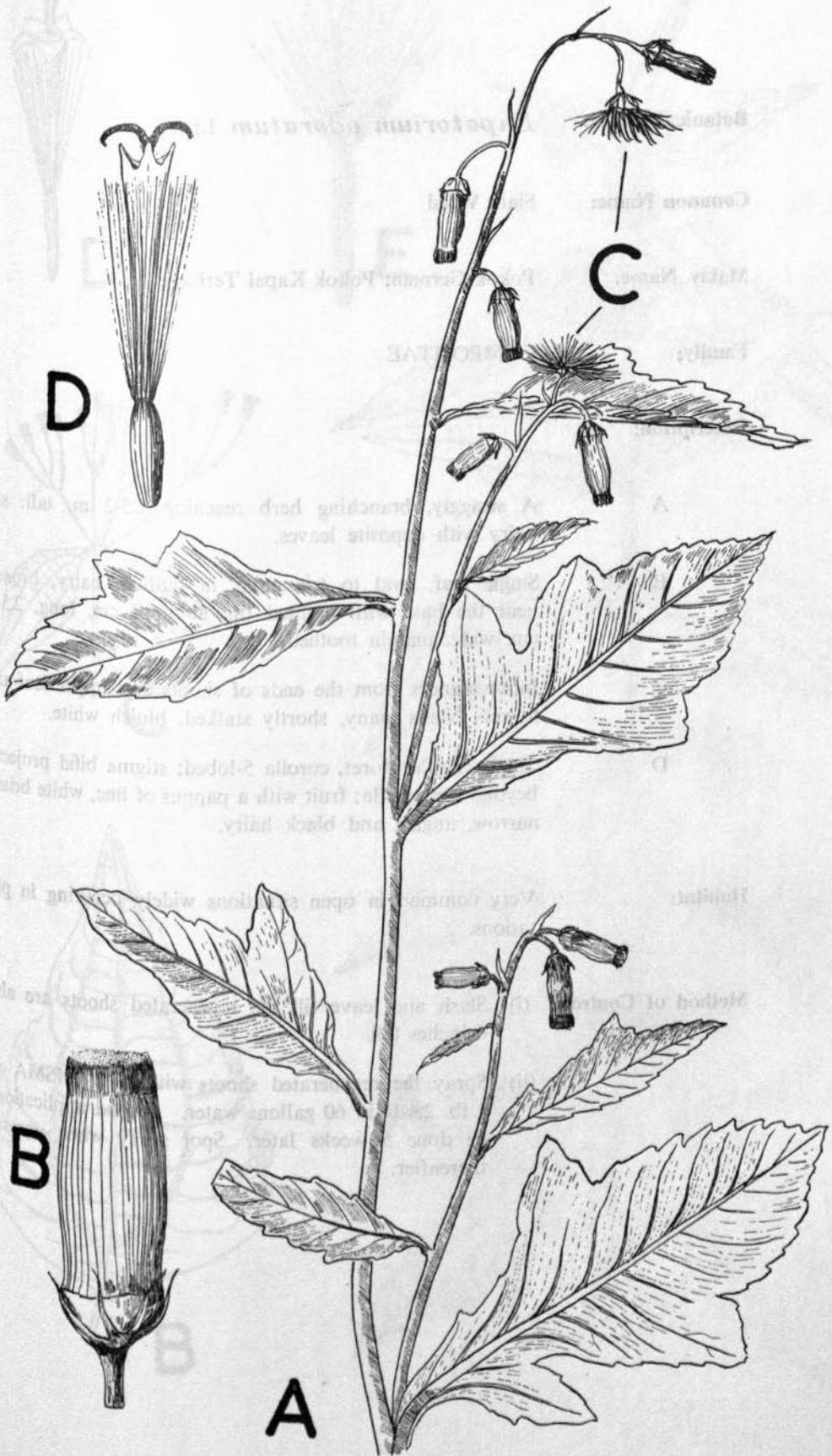
Family: COMPOSITAE

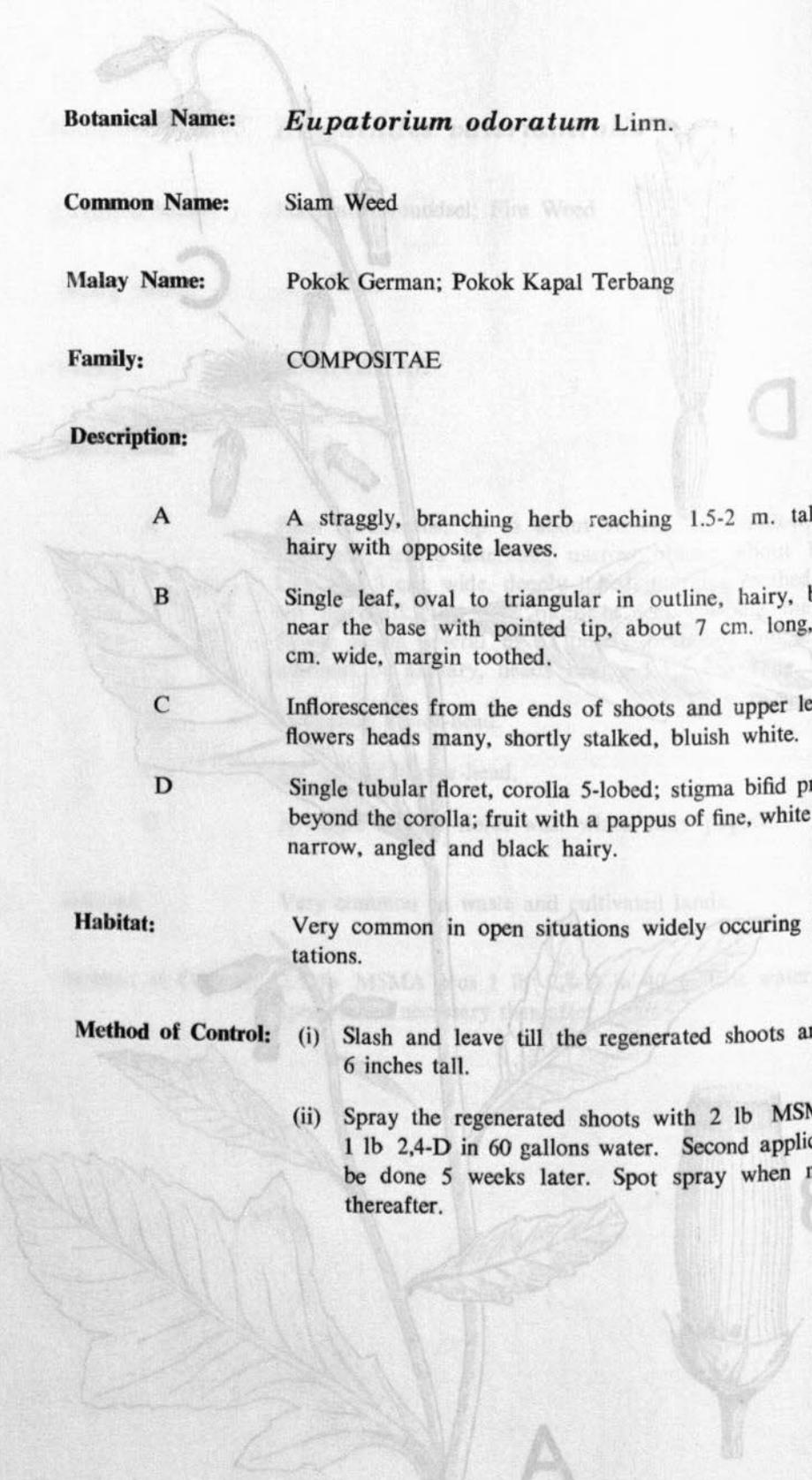
Description:

- A Stem herbaceous, up to about 90 cm. tall, hollow, much branched; leaves alternate, narrow oblong about 15 cm. long and 3 cm. wide, deeply lobed, margins toothed, without leaf-stalk, the base more or less clasping the stem; flower heads several in a loosely branched inflorescence, terminal or axillary, heads nearly 1-1.5 cm. long.
- B Unopened flower-head.
- C An opened flower-head.
- D A single tubular floret with white silky pappus.

Habitat: Very common on waste and cultivated lands.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray when necessary thereafter.





Botanical Name: *Eupatorium odoratum* Linn.

Common Name: Siam Weed

Malay Name: Pokok German; Pokok Kapal Terbang

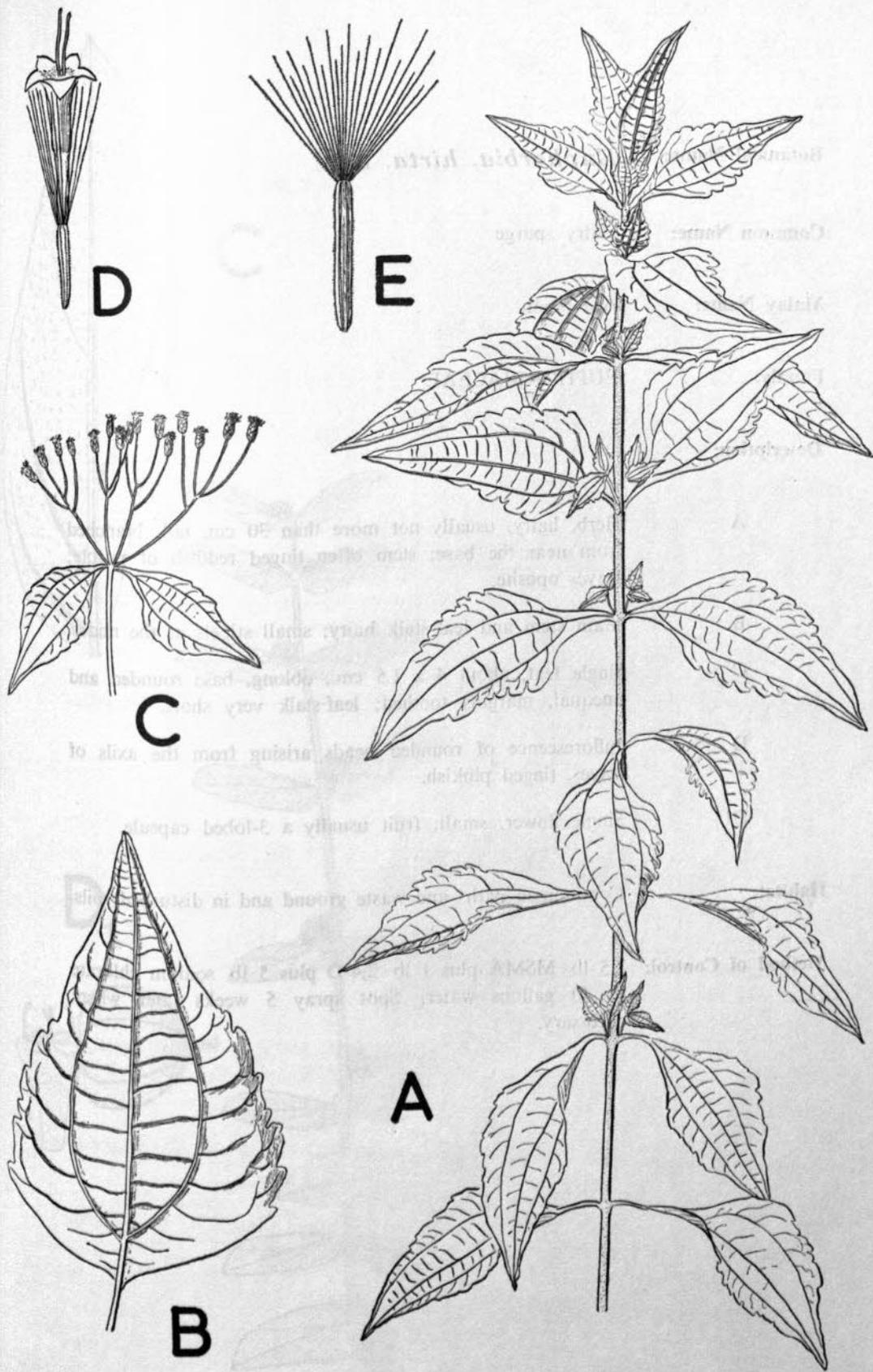
Family: COMPOSITAE

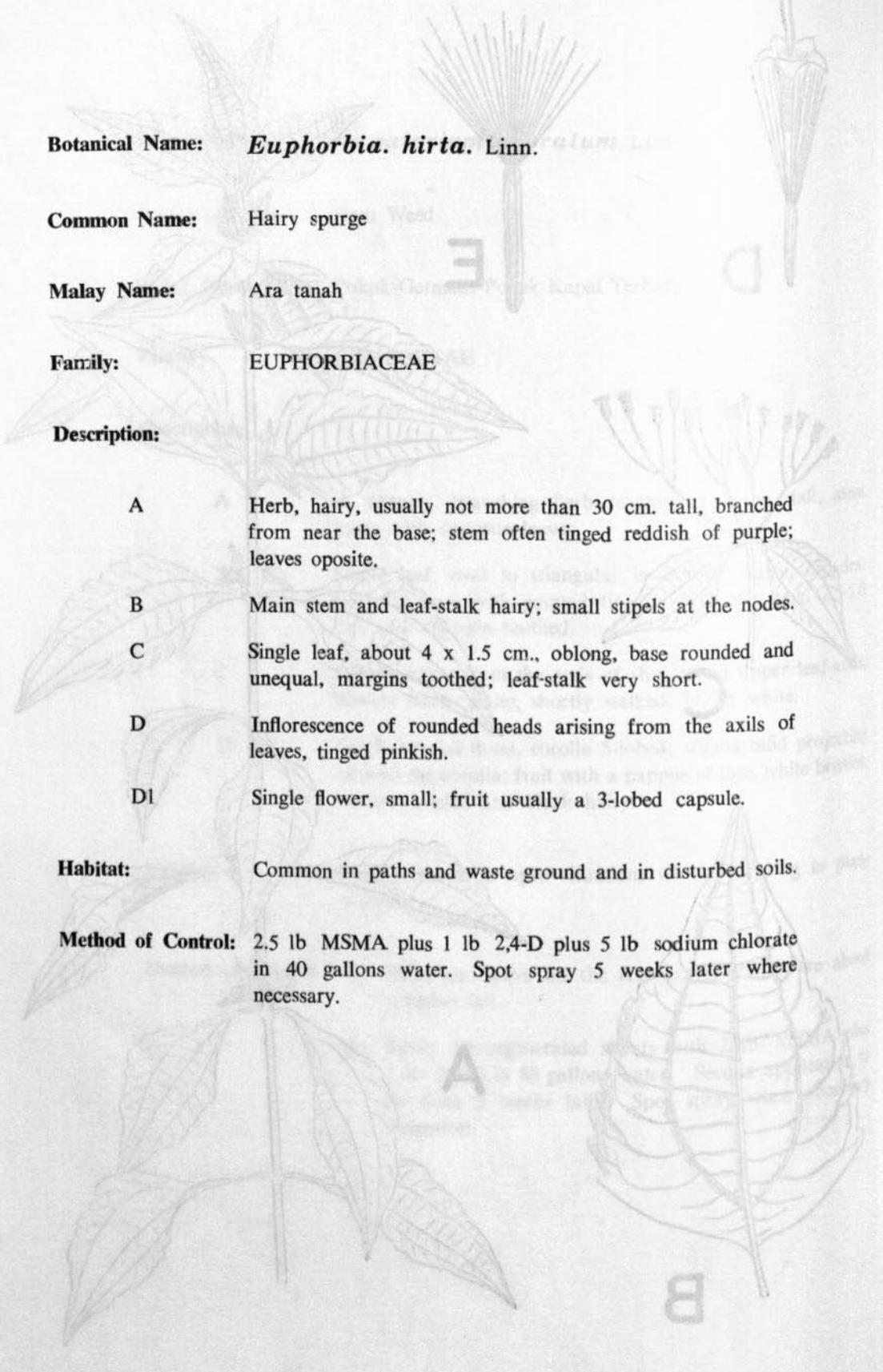
Description:

- A A straggly, branching herb reaching 1.5-2 m. tall; stem hairy with opposite leaves.
- B Single leaf, oval to triangular in outline, hairy, broadest near the base with pointed tip, about 7 cm. long, 2.5-5.0 cm. wide, margin toothed.
- C Inflorescences from the ends of shoots and upper leaf-axils, flowers heads many, shortly stalked, bluish white.
- D Single tubular floret, corolla 5-lobed; stigma bifid projecting beyond the corolla; fruit with a pappus of fine, white bristles, narrow, angled and black hairy.

Habitat: Very common in open situations widely occurring in plantations.

- Method of Control:**
- (i) Slash and leave till the regenerated shoots are about 6 inches tall.
 - (ii) Spray the regenerated shoots with 2 lb MSMA plus 1 lb 2,4-D in 60 gallons water. Second application to be done 5 weeks later. Spot spray when necessary thereafter.





Botanical Name: *Euphorbia. hirta.* Linn.

Common Name: Hairy spurge

Malay Name: Ara tanah

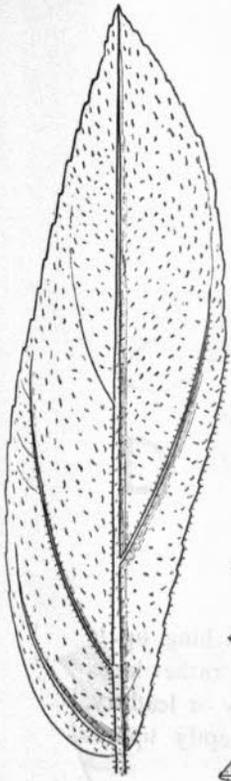
Family: EUPHORBIACEAE

Description:

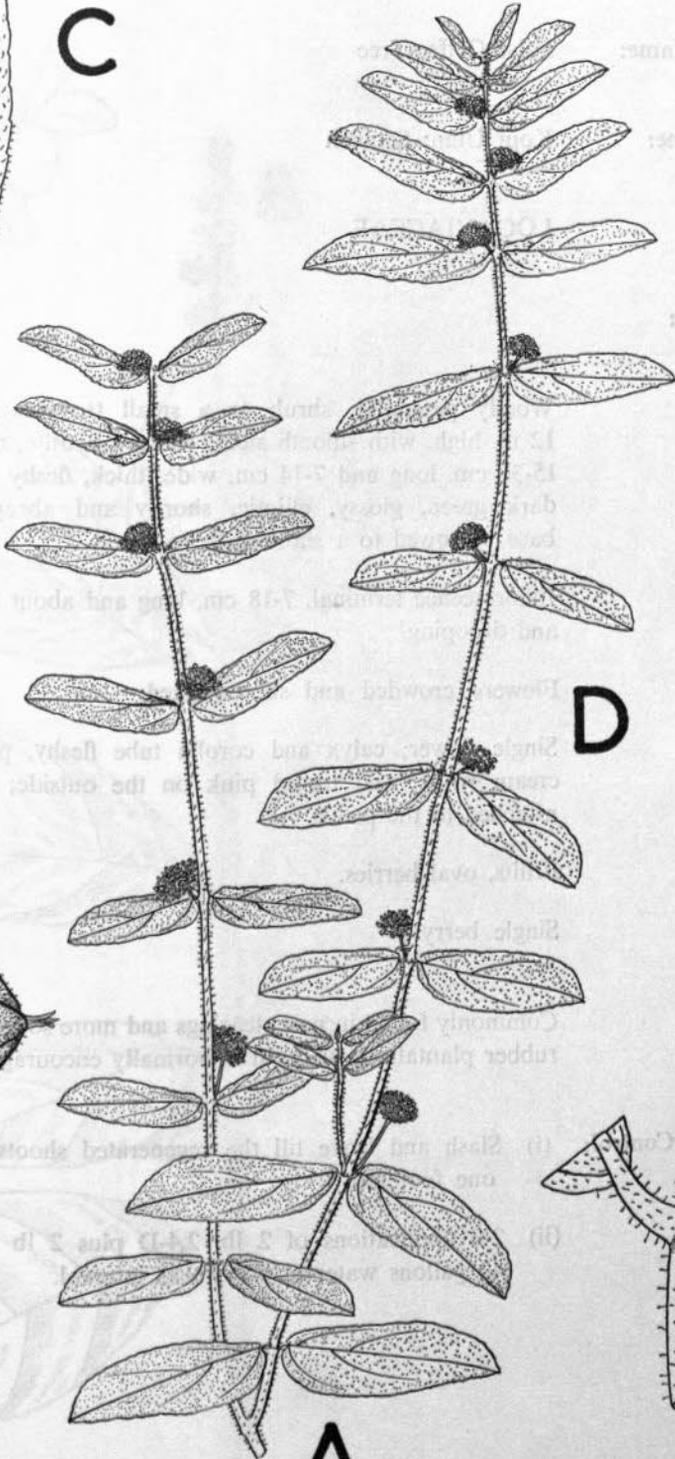
- A Herb, hairy, usually not more than 30 cm. tall, branched from near the base; stem often tinged reddish of purple; leaves opposite.
- B Main stem and leaf-stalk hairy; small stipels at the nodes.
- C Single leaf, about 4 x 1.5 cm., oblong, base rounded and unequal, margins toothed; leaf-stalk very short.
- D Inflorescence of rounded heads arising from the axils of leaves, tinged pinkish.
- D1 Single flower, small; fruit usually a 3-lobed capsule.

Habitat: Common in paths and waste ground and in disturbed soils.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water. Spot spray 5 weeks later where necessary.

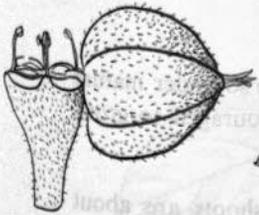


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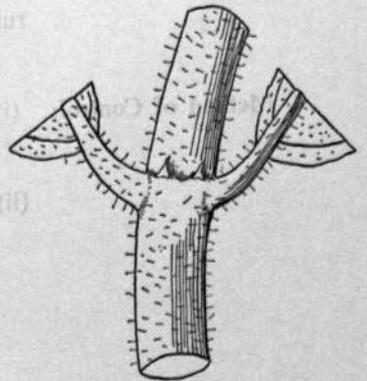


D

D₁



B



A

Botanical Name: *Fagraeae racemosa* Jack ex. Wall.

Common Name: False Coffee-Tree

Malay Name: Kopi Utan; Sepuleh

Family: LOGANIACEAE

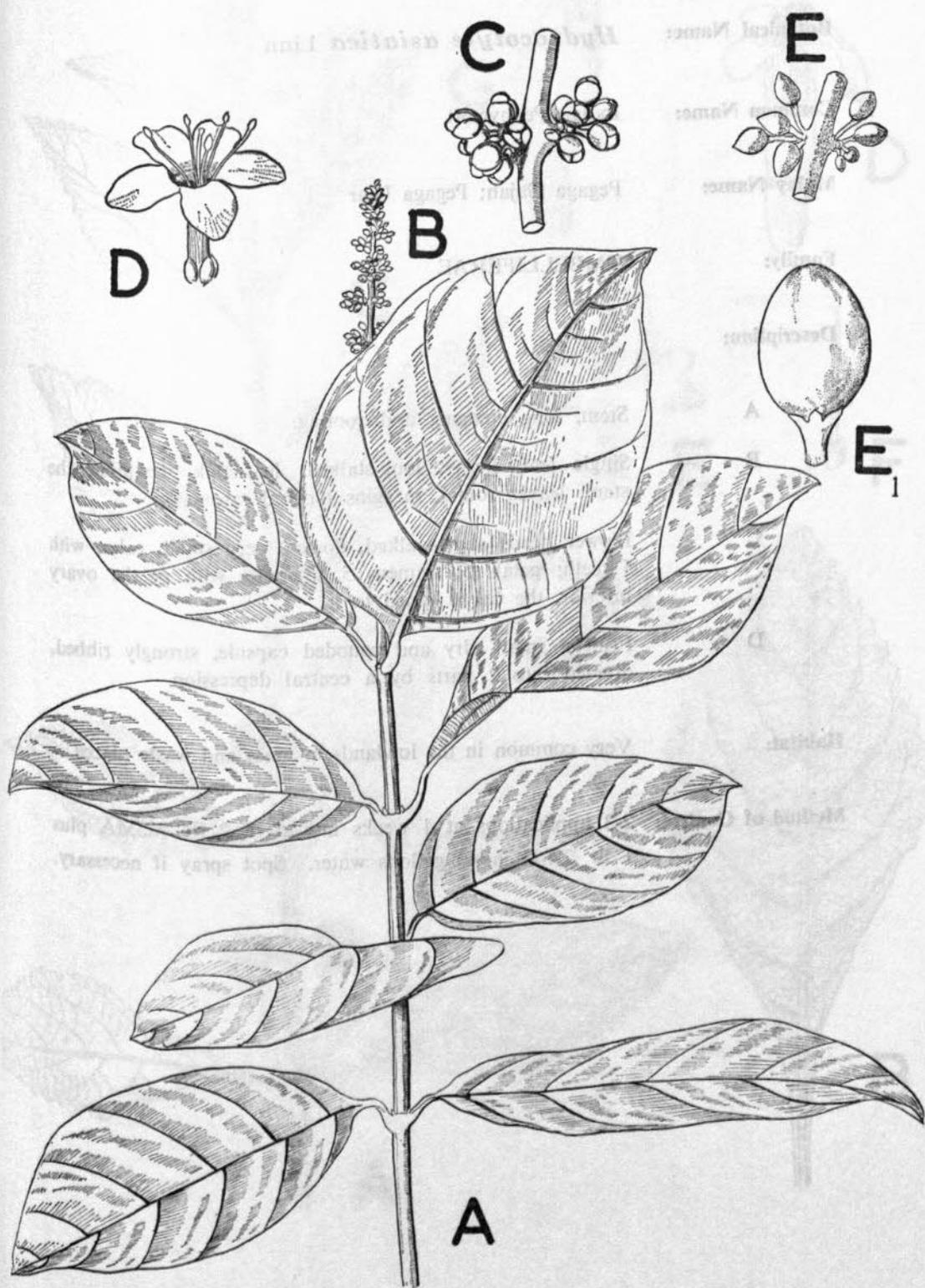
Description:

- A Woody perennial; shrub or a small tree reaching up to 12 m. high, with smooth stem; leaves opposite, rather large, 15-30 cm. long and 7-14 cm. wide, thick, fleshy or leathery, dark green, glossy, elliptic, shortly and abruptly tipped, base narrowed to a short stalk.
- B Inflorescence terminal, 7-18 cm. long and about 2 cm. wide, and drooping.
- C Flowers crowded and short-stalked.
- D Single flower; calyx and corolla tube fleshy, petals thick, cream white, and tinged pink on the outside; stamens 5, attached to the petals.
- E Fruits, oval berries.
- E1 Single berry.

Habitat:

Commonly found in new clearings and more so under mature rubber plantations where it is normally encouraged to grow.

- Method of Control:**
- (i) Slash and leave till the regenerated shoots are about one foot tall.
 - (ii) 2-3 applications of 2 lb 2,4-D plus 2 lb MSMA in 40 gallons water at 6-7 weeks interval.



Botanical Name: *Hydrocotyle asiatica* Linn.

Common Name: Indian Pennywort

Malay Name: Pegaga Gajah; Pegaga Ular

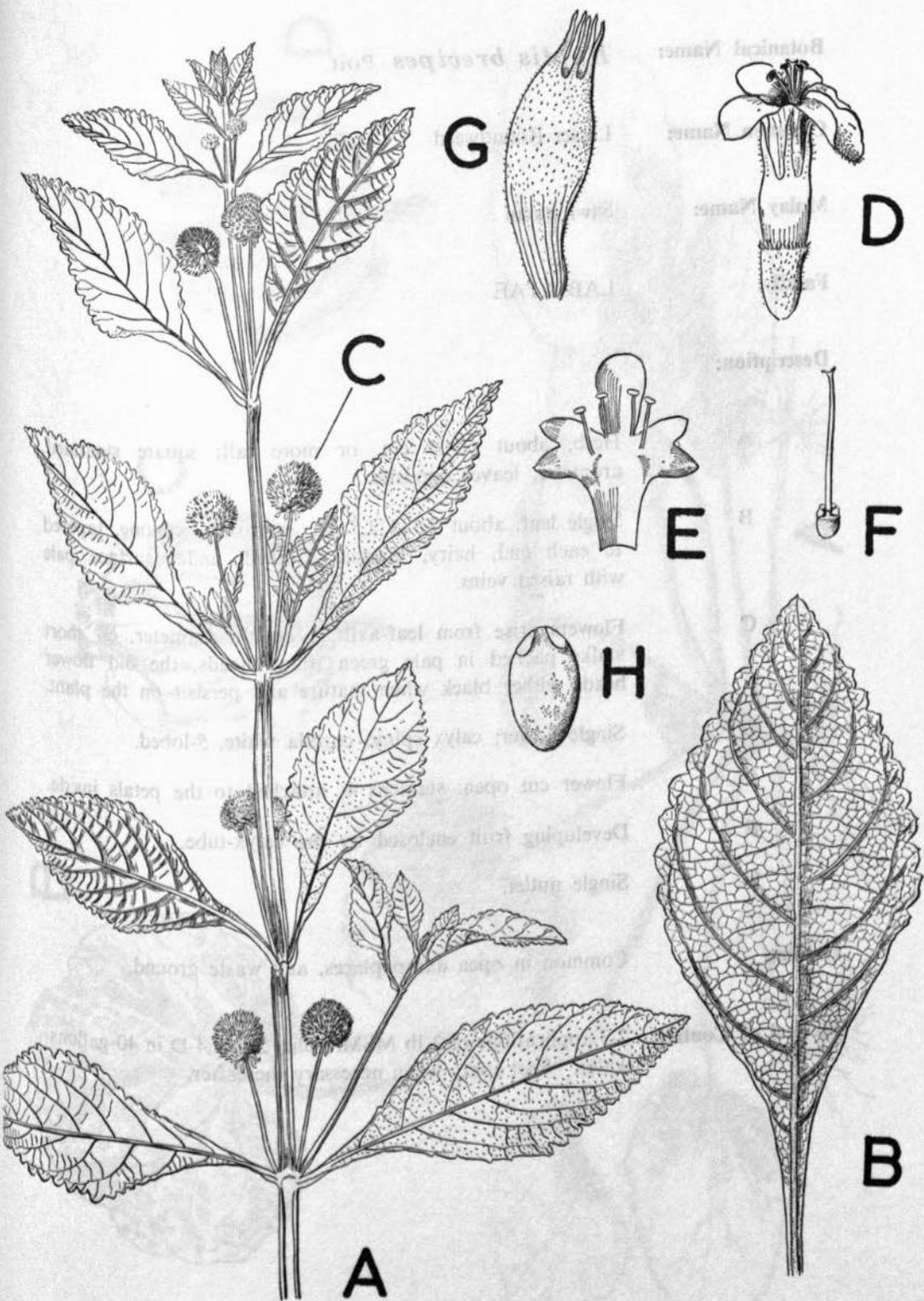
Family: UMBELLIFERAE

Description:

- A Stem, long creeping and rooting.
- B Single leaf, fleshy, long-stalked; leaf-stalk sheathing the stem; leaves round, margins toothed, aromatic.
- C Flower heads short-stalked, flowers very small, calyx with 5 teeth; petals 5; stamens 5, alternate with petals; ovary inferior, the calyx joined to it.
- D Fruit a small, dry and rounded capsule, strongly ribbed, divided into 2 parts by a central depression.

Habitat: Very common in the lowlands in grass and waste places.

Method of Control: 2-3 applications at 4 weeks interval of 2 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray if necessary.



Botanical Name: *Hyptis brevipes* Poit.

Common Name: Lesser Roundweed

Malay Name: Sawi hutan

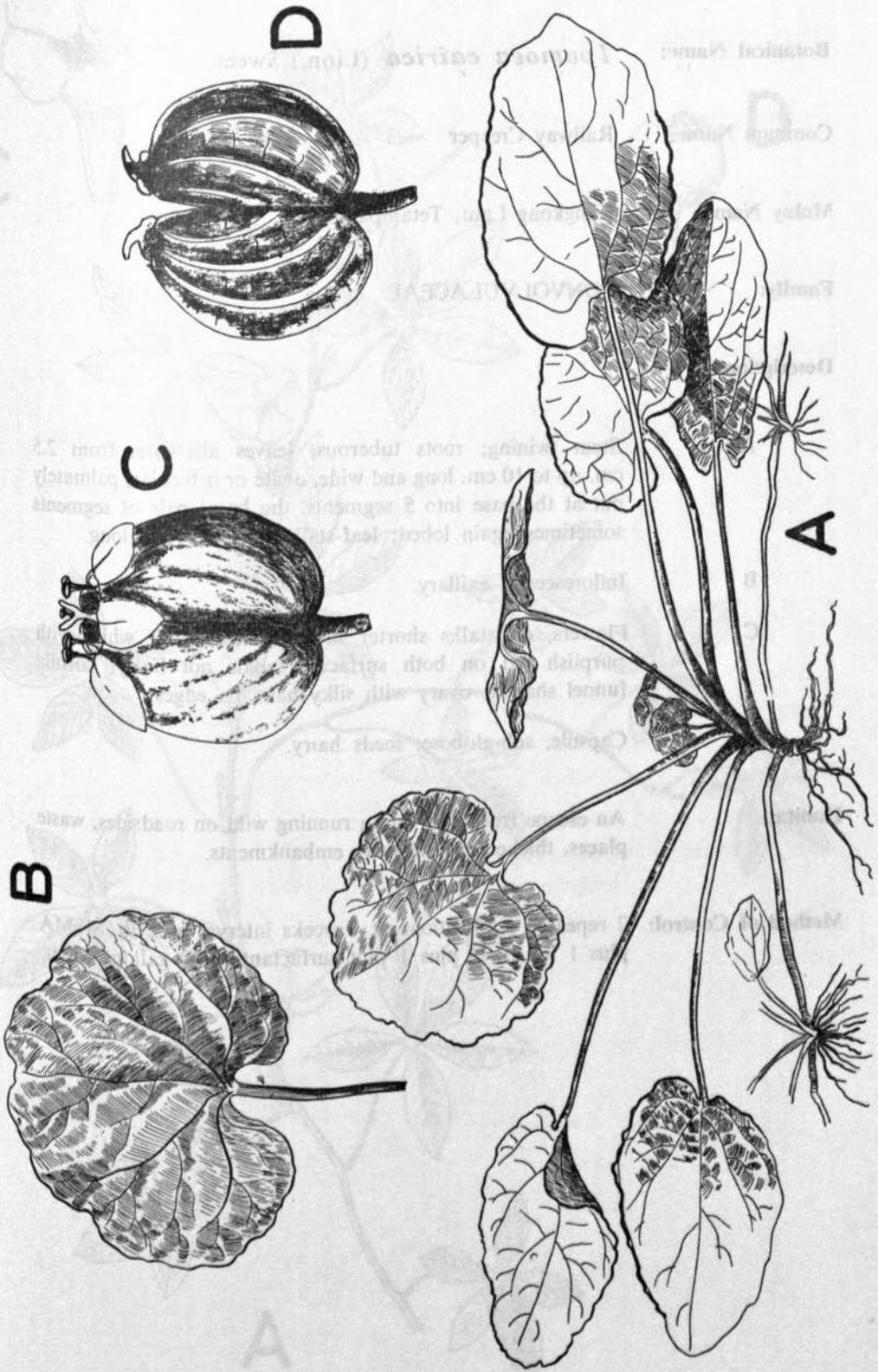
Family: LABIATAE

Description:

- A Herb, about 60-90 cm. or more tall; square stemmed, aromatic; leaves opposite.
- B Single leaf, about 7.5 x 2.5 cm., narrow to oblong, tapered to each end, hairy, margins toothed, under surface pale with raised veins.
- C Flowers arise from leaf-axils, 1 cm. in diameter, on short stalks packed in pale green round heads, the old flower heads wither black when mature and persist on the plant.
- D Single flower; calyx spiny; corolla white, 5-lobed.
- E Flower cut open; stamens 4; attached to the petals inside.
- F Developing fruit enclosed by the calyx-tube.
- G Single nutlet.

Habitat: Common in open damp places, and waste ground.

Method of Control: 2-3 applications of 2 lb MSMA plus 2 lb 2,4-D in 40 gallons water. Spot spray when necessary thereafter.



Botanical Name: *Ipomoea cairica* (Linn.) Sweet

Common Name: Railway Creeper

Malay Name: Kangkong Laut; Tetampajam

Family: CONVOLVULACEAE

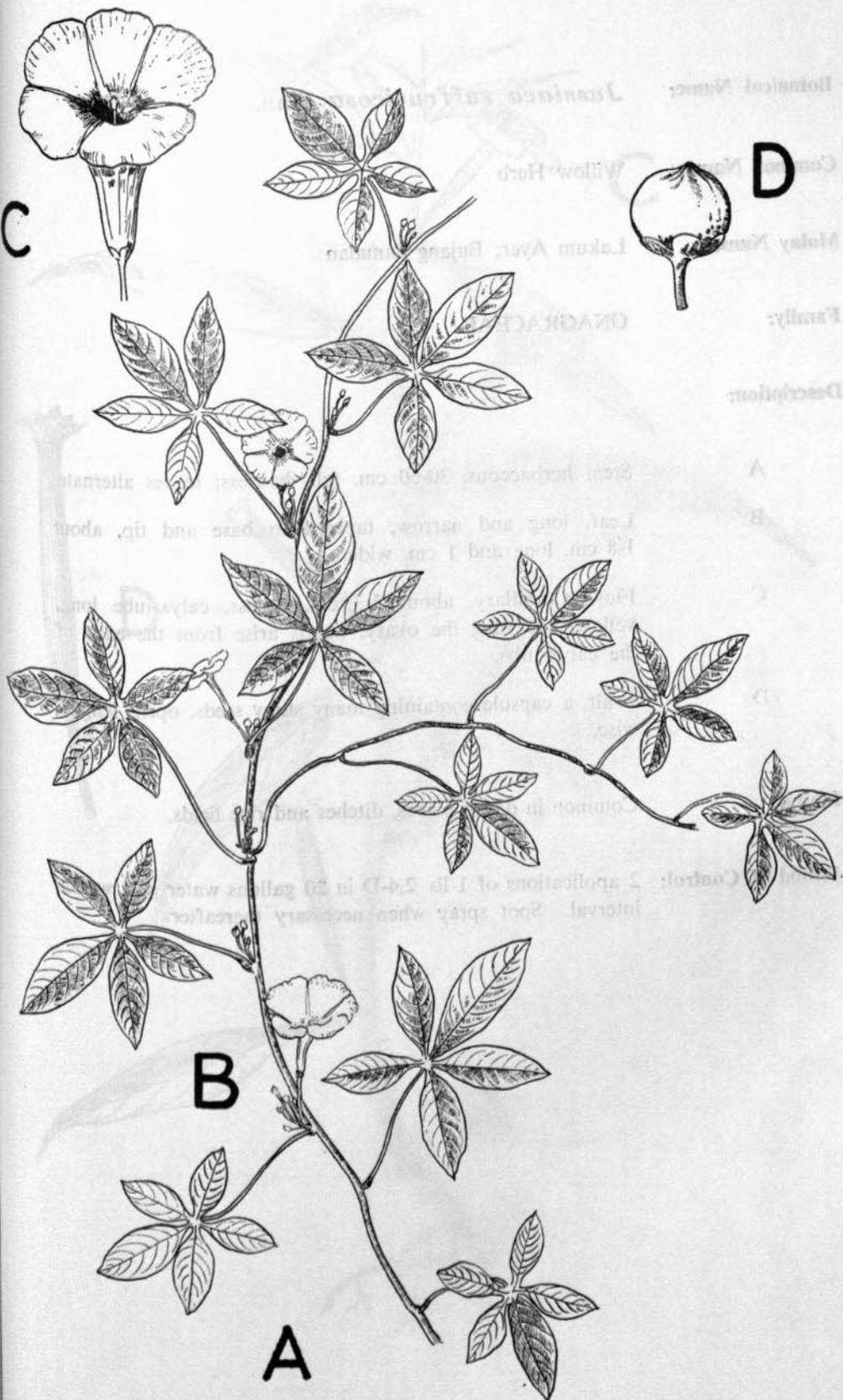
Description:

- A Stem twining; roots tuberous; leaves alternate, from 2.5 cm. up to 10 cm. long and wide, ovate or orbicular, palmately cut at the base into 5 segments, the basal pair of segments sometimes again lobed; leaf-stalk up to 10 cm. long.
- B Inflorescence axillary.
- C Flowers, on stalks shorter than the leaf-stalk, white with purplish red on both surfaces; sepals not hairy; corolla funnel shaped; ovary with silky hairs on edges.
- D Capsule, sub-globose; seeds hairy.

Habitat:

An escape from cultivation running wild on roadsides, waste places, thickets and railway embankments.

Method of Control: 2 repeated applications at 4 weeks interval of 2 lb MSMA plus 1 lb 2,4-D plus 1 pint surfactant in 40 gallons water.



Botanical Name: *Jussiaea suffruticosa* Linn.

Common Name: Willow Herb

Malay Name: Lakum Ayer; Bujang Samalan

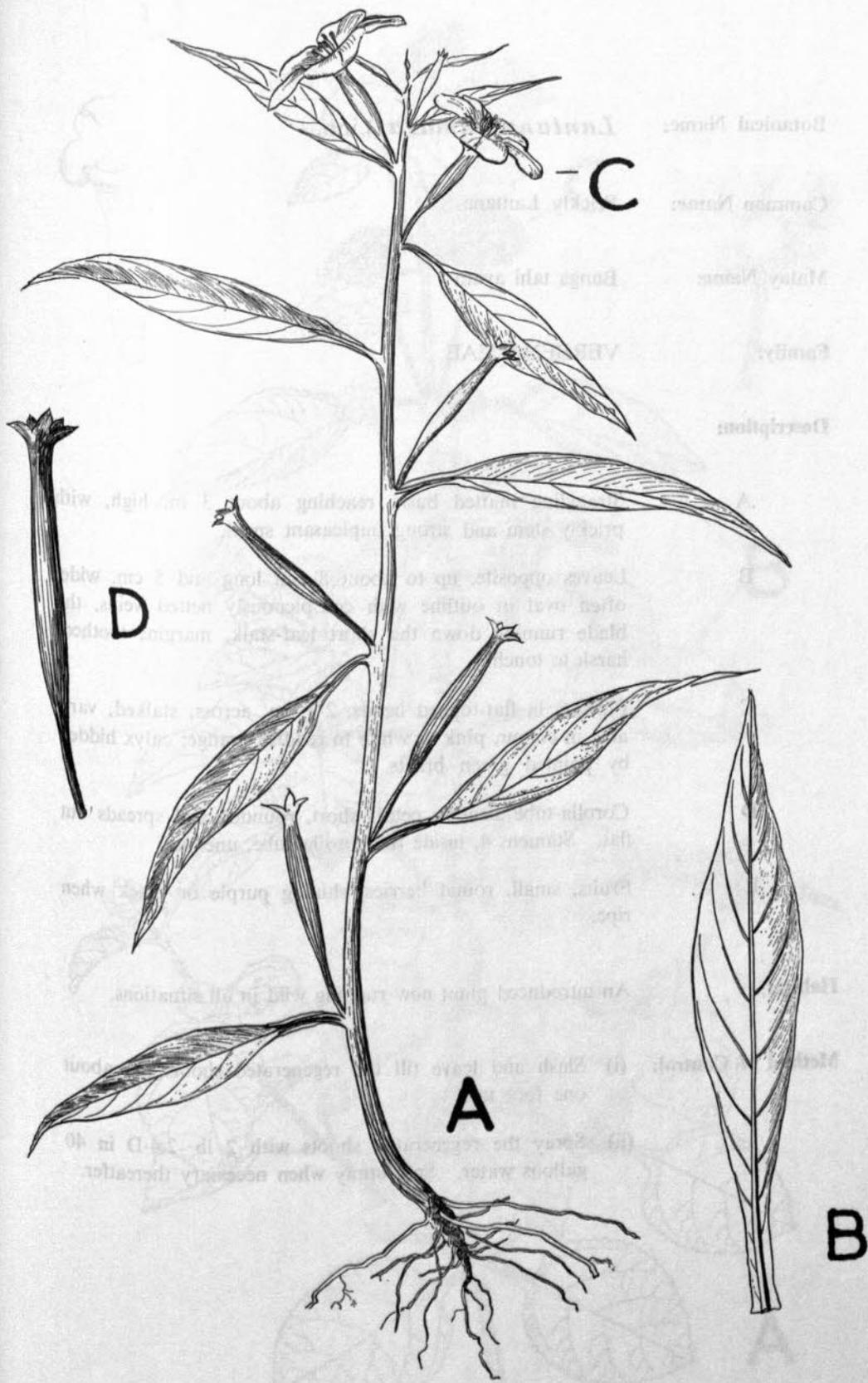
Family: ONAGRACEAE

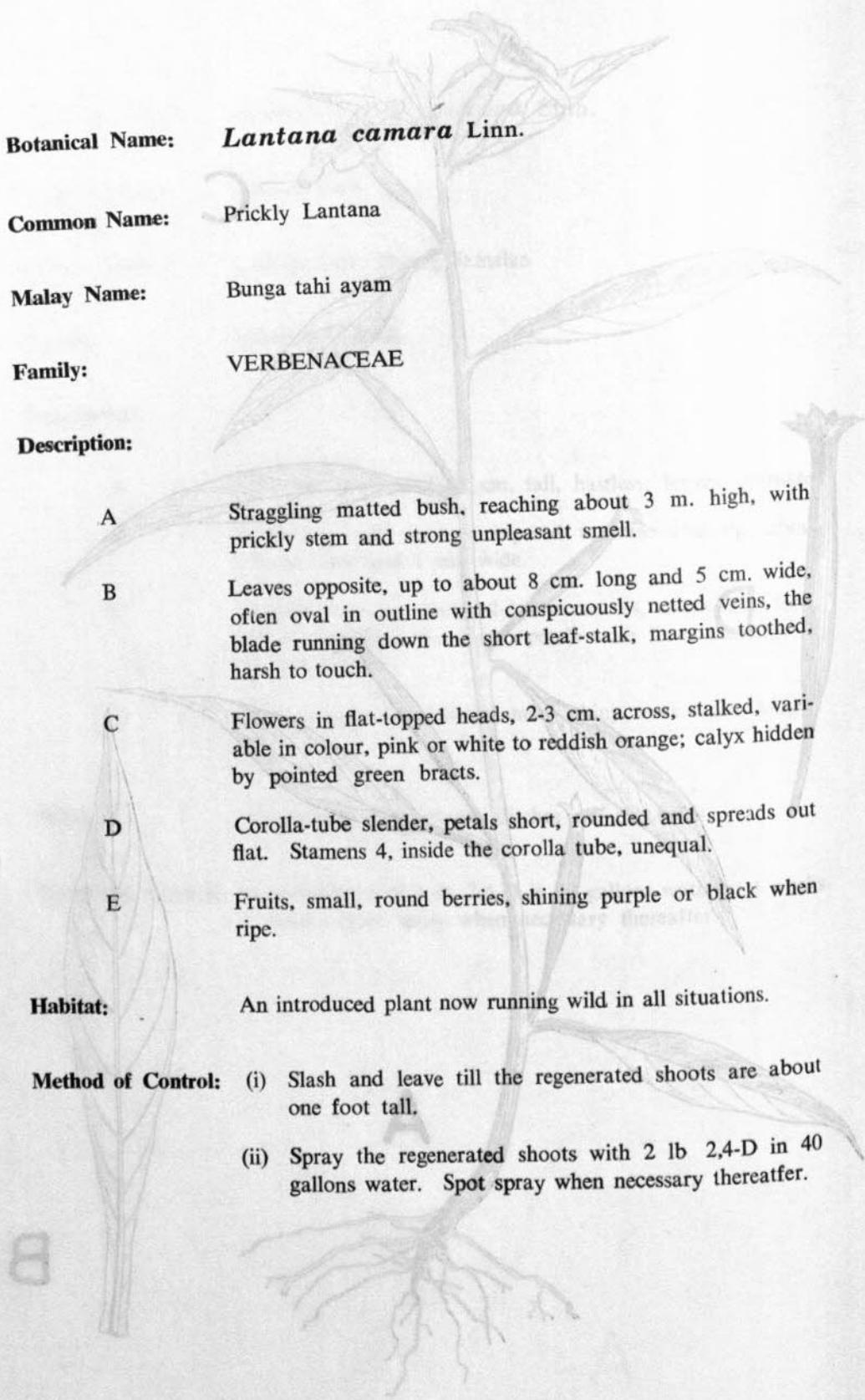
Description:

- A Stem herbaceous, 30-60 cm. tall, hairless; leaves alternate.
- B Leaf, long and narrow, tapered to base and tip, about 1-8 cm. long and 1 cm. wide.
- C Flowers axillary, about 2-3 cm. across, calyx-tube long, yellow, enclosing the ovary; petals arise from the edge of the calyx-tube.
- D Fruit, a capsule containing many shiny seeds, opens length-wise.

Habitat: Common in damp places, ditches and rice fields.

Method of Control: 2 applications of 1 lb 2,4-D in 20 gallons water at 4 weeks interval. Spot spray when necessary thereafter.





Botanical Name: *Lantana camara* Linn.

Common Name: Prickly Lantana

Malay Name: Bunga tahi ayam

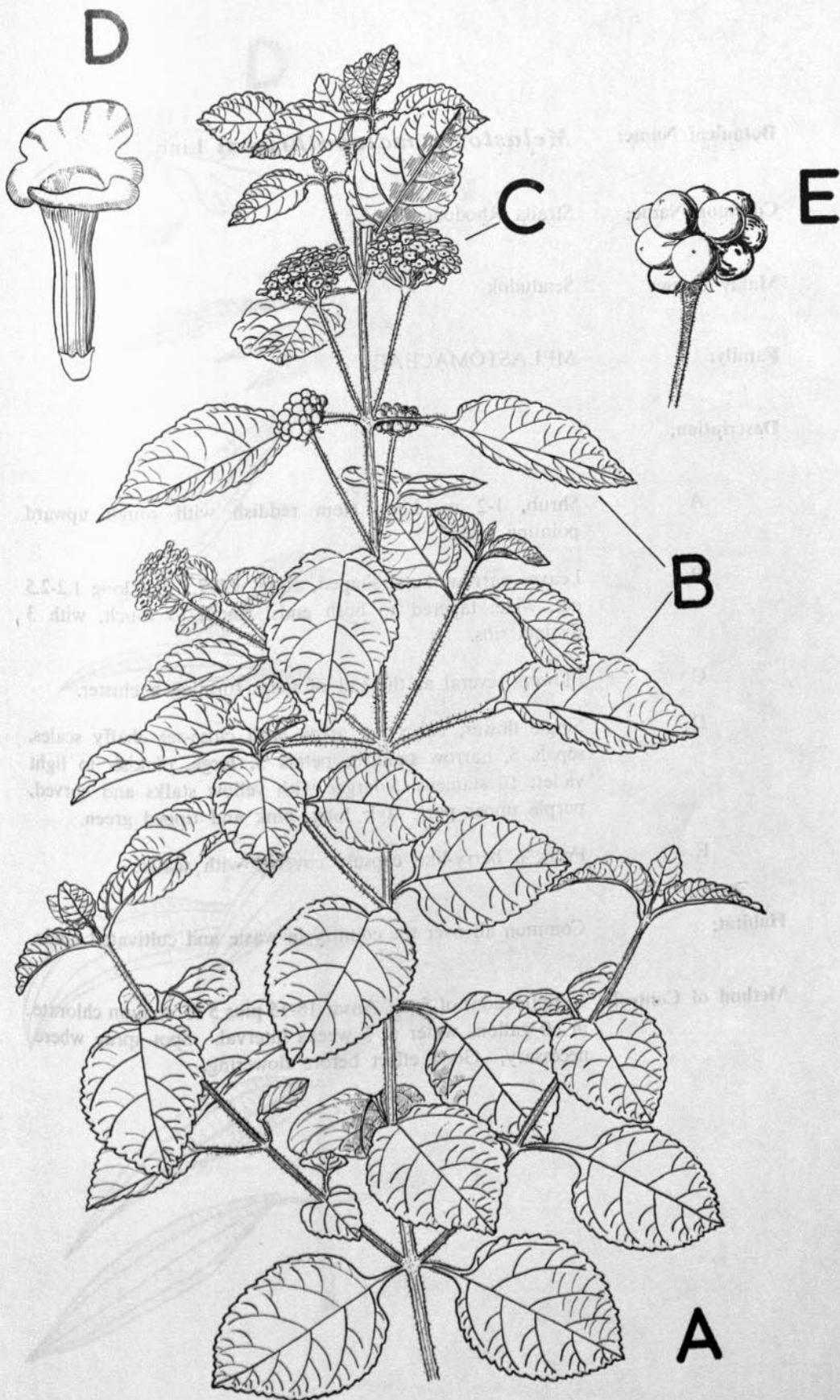
Family: VERBENACEAE

Description:

- A Straggling matted bush, reaching about 3 m. high, with prickly stem and strong unpleasant smell.
- B Leaves opposite, up to about 8 cm. long and 5 cm. wide, often oval in outline with conspicuously netted veins, the blade running down the short leaf-stalk, margins toothed, harsh to touch.
- C Flowers in flat-topped heads, 2-3 cm. across, stalked, variable in colour, pink or white to reddish orange; calyx hidden by pointed green bracts.
- D Corolla-tube slender, petals short, rounded and spreads out flat. Stamens 4, inside the corolla tube, unequal.
- E Fruits, small, round berries, shining purple or black when ripe.

Habitat: An introduced plant now running wild in all situations.

- Method of Control:**
- (i) Slash and leave till the regenerated shoots are about one foot tall.
 - (ii) Spray the regenerated shoots with 2 lb 2,4-D in 40 gallons water. Spot spray when necessary thereafter.



Botanical Name: *Melastoma malabathricum* Linn.

Common Name: Straits Rhododendron

Malay Name: Sendudok

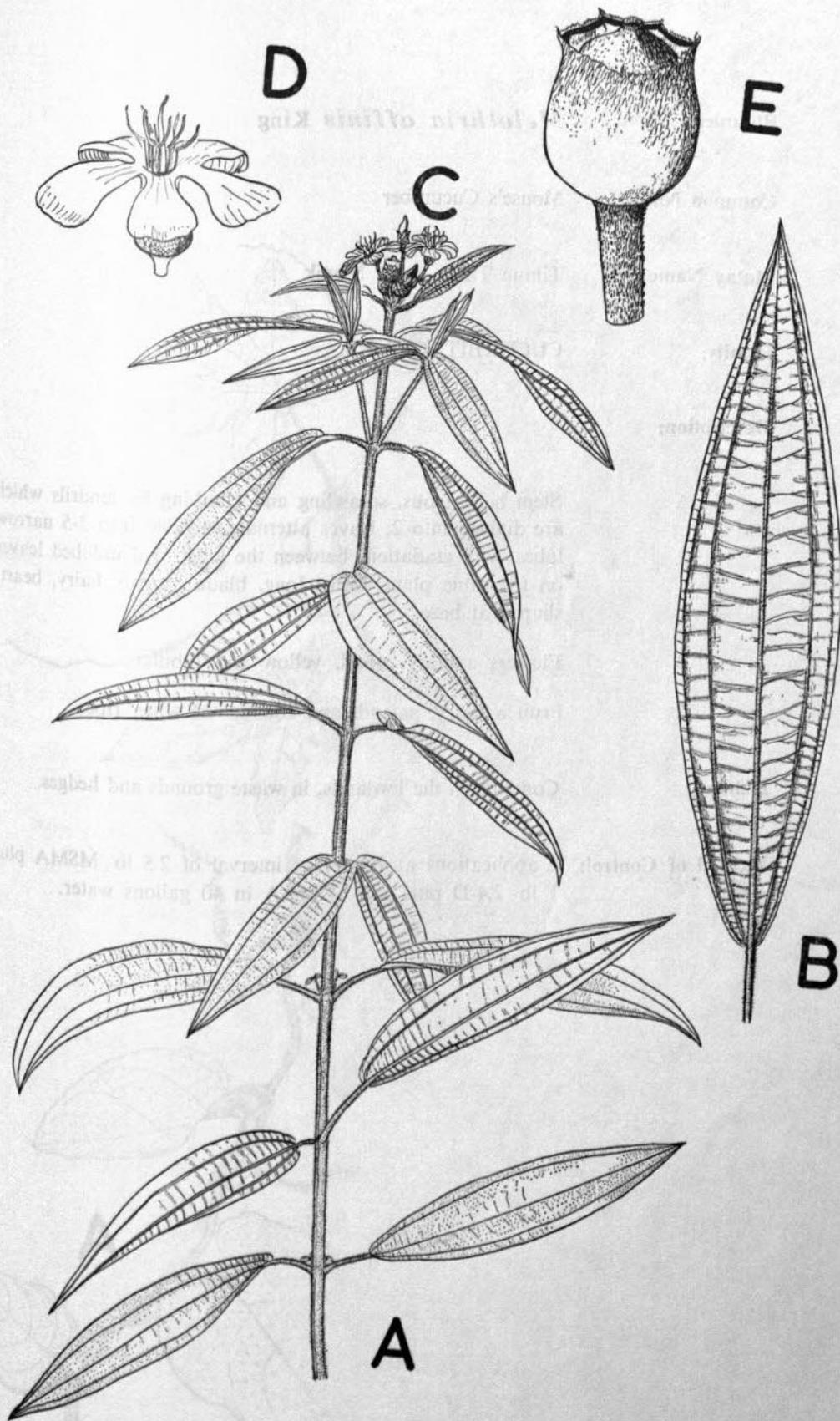
Family: MELASTOMACEAE

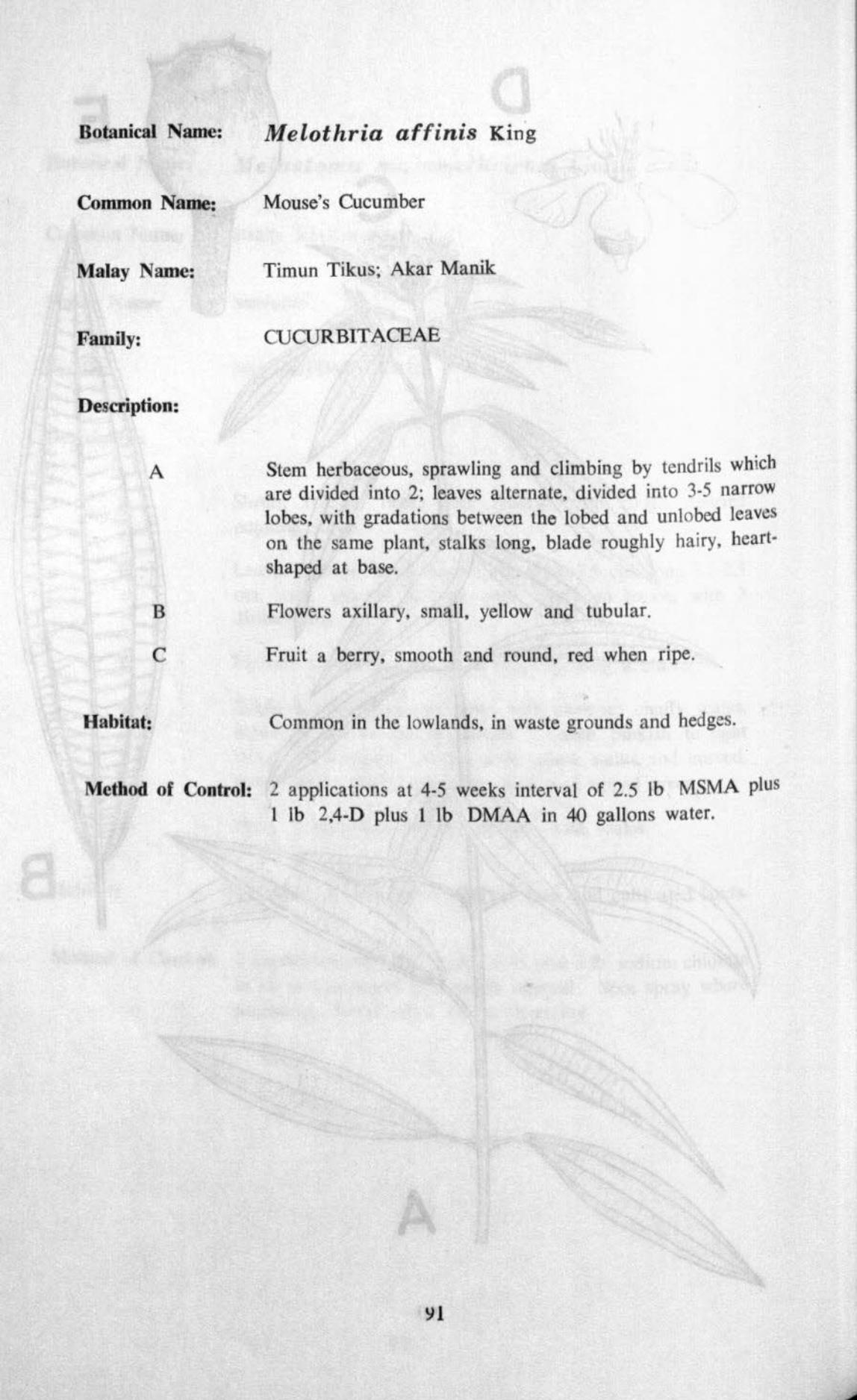
Description:

- A Shrub, 1-2 m. high; stem reddish with rough upward pointing scales.
- B Leaves narrow, lance-shaped, about 5.0-7.5 cm. long 1.2-2.5 cm. wide, tapered to both ends, rough to touch, with 3 distinct ribs.
- C Flowers several at the end of twigs forming a cluster.
- D Single flower; calyx-cup green with close-set chaffy scales, sepals 5, narrow reddish; petals 5, large, pinkish to light violet; 10 stamens, 5 larger with yellow stalks and curved, purple upper part; style long, pink and tipped green.
- E Fruit, a berry-like capsule covered with scales.

Habitat: Common all over the country in waste and cultivated lands.

Method of Control: 2 applications of 5 pts Ansar 18-15 plus 5 lb sodium chlorate in 60 gallons water at 5 weeks interval. Spot spray where necessary. Good effect before flowering.





Botanical Name: *Melothria affinis* King

Common Name: Mouse's Cucumber

Malay Name: Timun Tikus; Akar Manik

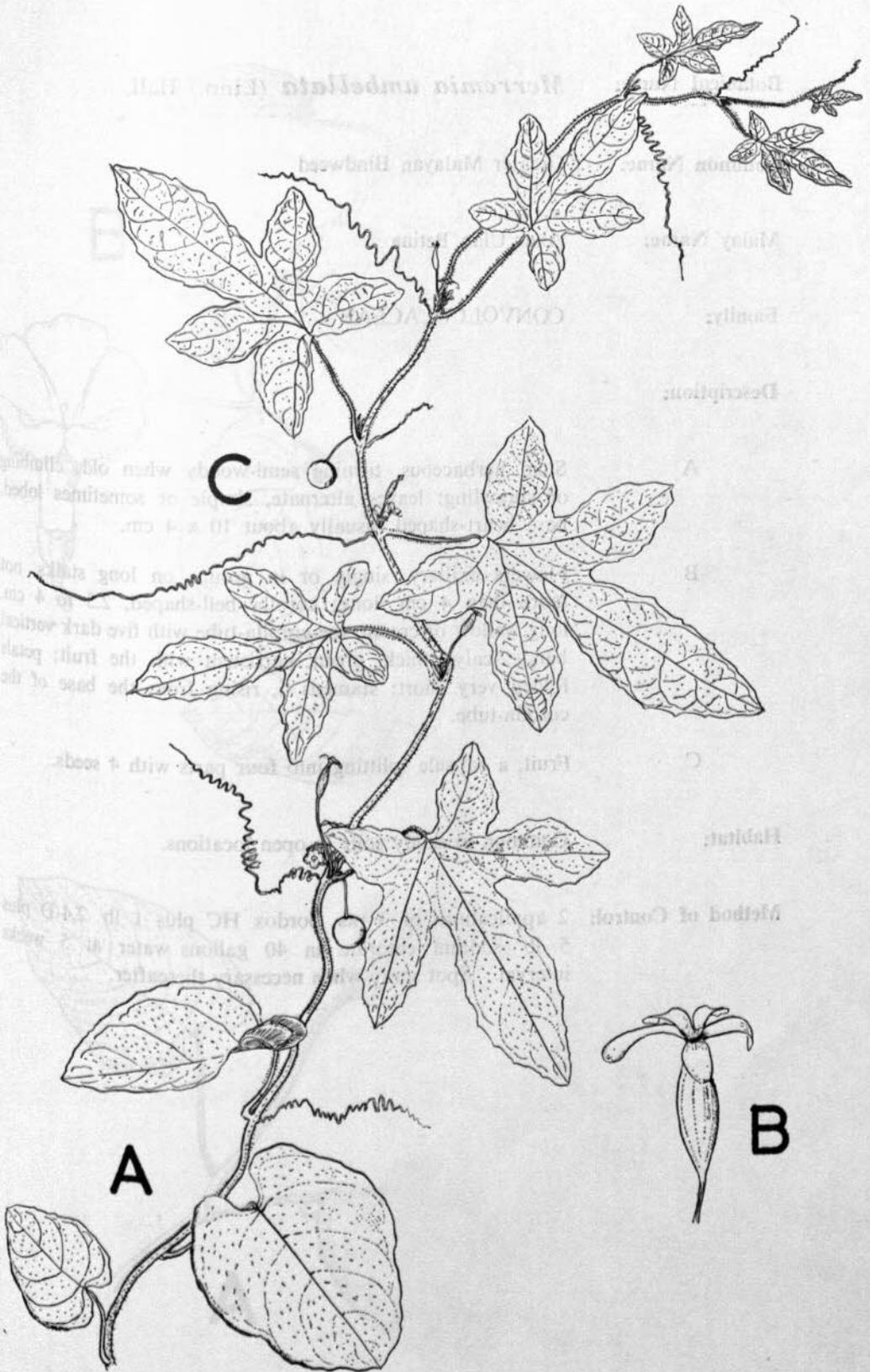
Family: CUCURBITACEAE

Description:

- A Stem herbaceous, sprawling and climbing by tendrils which are divided into 2; leaves alternate, divided into 3-5 narrow lobes, with gradations between the lobed and unlobed leaves on the same plant, stalks long, blade roughly hairy, heart-shaped at base.
- B Flowers axillary, small, yellow and tubular.
- C Fruit a berry, smooth and round, red when ripe.

Habitat: Common in the lowlands, in waste grounds and hedges.

Method of Control: 2 applications at 4-5 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D plus 1 lb DMAA in 40 gallons water.



Botanical Name: *Merremia umbellata* (Linn.) Hall.

Common Name: Greater Malayan Bindweed

Malay Name: Akar Ulan Betina

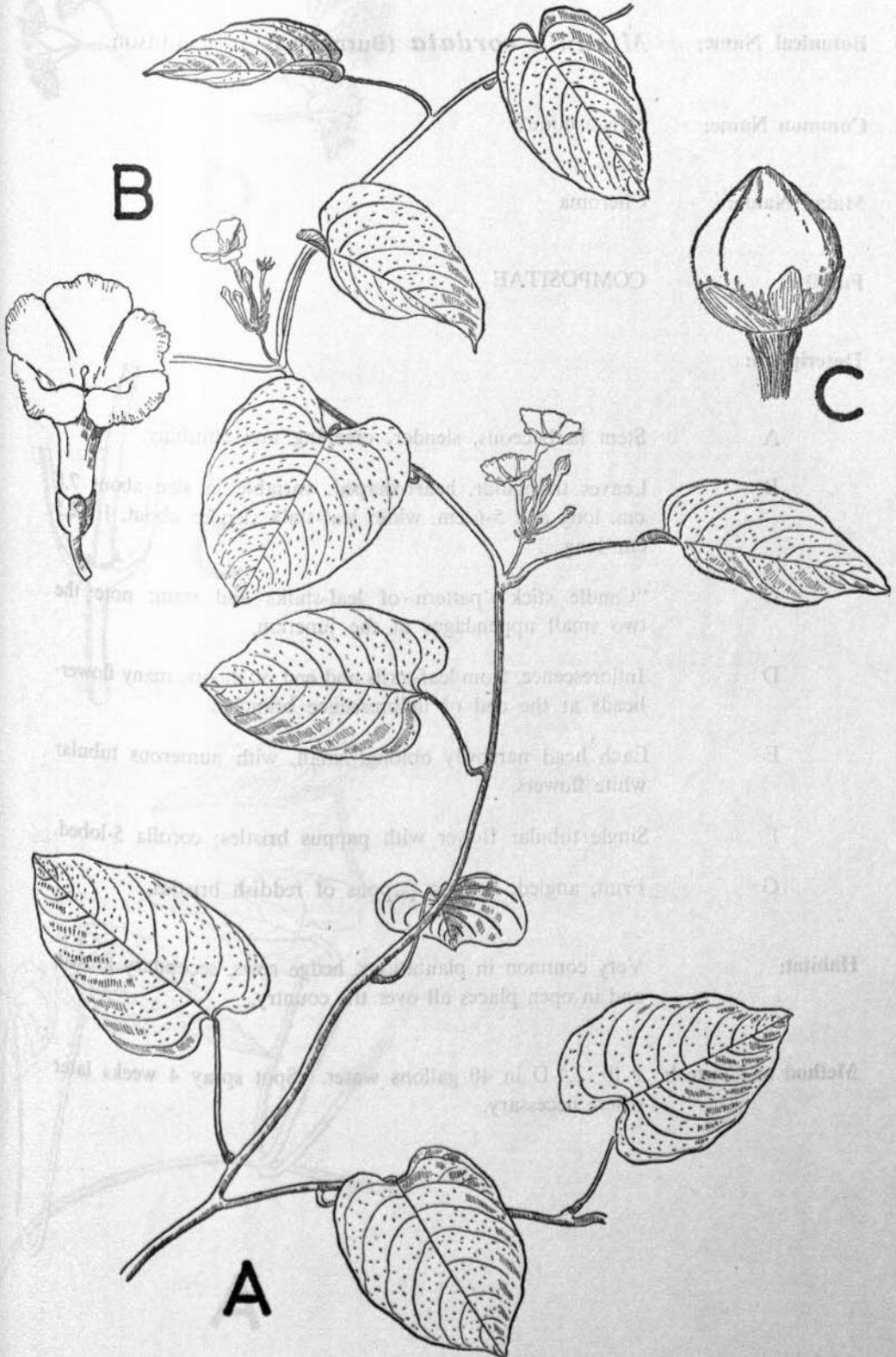
Family: CONVOLCULACEAE

Description:

- A Stem herbaceous, turning semi-woody when old, climbing or sprawling; leaves alternate, simple or sometimes lobed, base heart-shaped, usually about 10 x 4 cm.
- B Flowers axillary, singly or in groups on long stalks, not more than 4 cm. long; corolla bell-shaped, 2.5 to 4 cm. long, yellow or cream, the corolla-tube with five dark vertical bands; calyx thick, green, persistent with the fruit; petals folded very short; stamens 5, rising from the base of the corolla-tube.
- C Fruit, a capsule splitting into four parts with 4 seeds.

Habitat: Common in sandy soils in open locations.

Method of Control: 2 applications of 3 pts Sordox HC plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Mikania cordata* (Burm. f) B. L. Robinson.

Common Name: Mile-a-minute

Malay Name: Cheroma

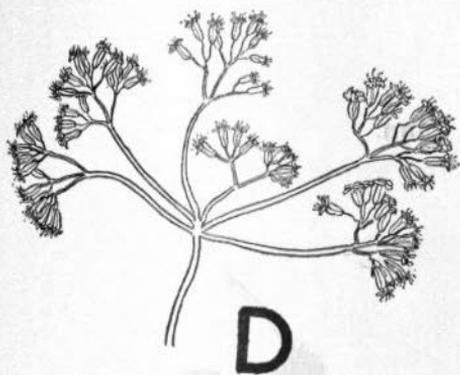
Family: COMPOSITAE

Description:

- A Stem herbaceous, slender, creeping and climbing.
- B Leaves triangular, heart-shaped, variable in size about 7.8 cm. long and 5-6 cm. wide; leaf-stalk slender about, 1.2-2.5 cm. long.
- C "Candle stick" pattern of leaf-stalks and stem; note the two small appendages at the junction.
- D Inflorescence, from leaf-axils and end of shoots, many flower-heads at the end of inflorescence branches.
- E Each head narrowly oblong, small, with numerous tubular white flowers.
- F Single tubular flower with pappus bristles; corolla 5-lobed.
- G Fruit, angled, bearing pappus of reddish bristles.

Habitat: Very common in plantations, hedge rows, secondary growth and in open places all over the country.

Method of Control: 2 lb 2,4-D in 40 gallons water. Spot spray 4 weeks later where necessary.



D



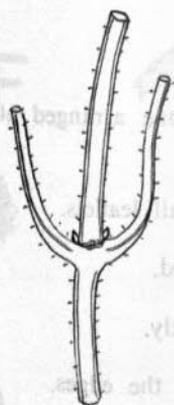
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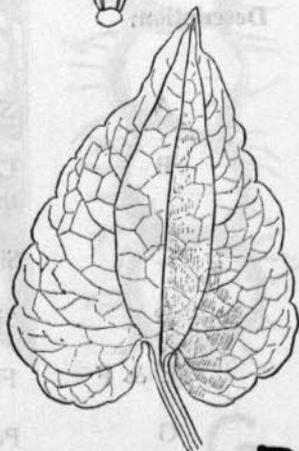
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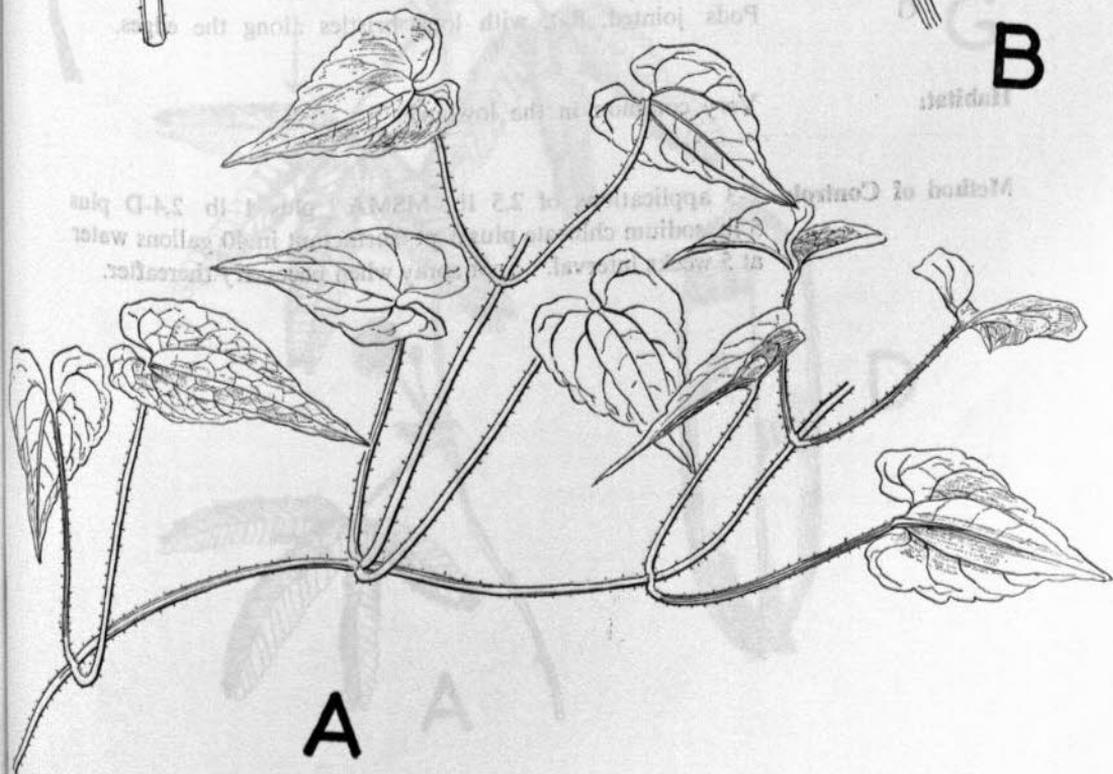
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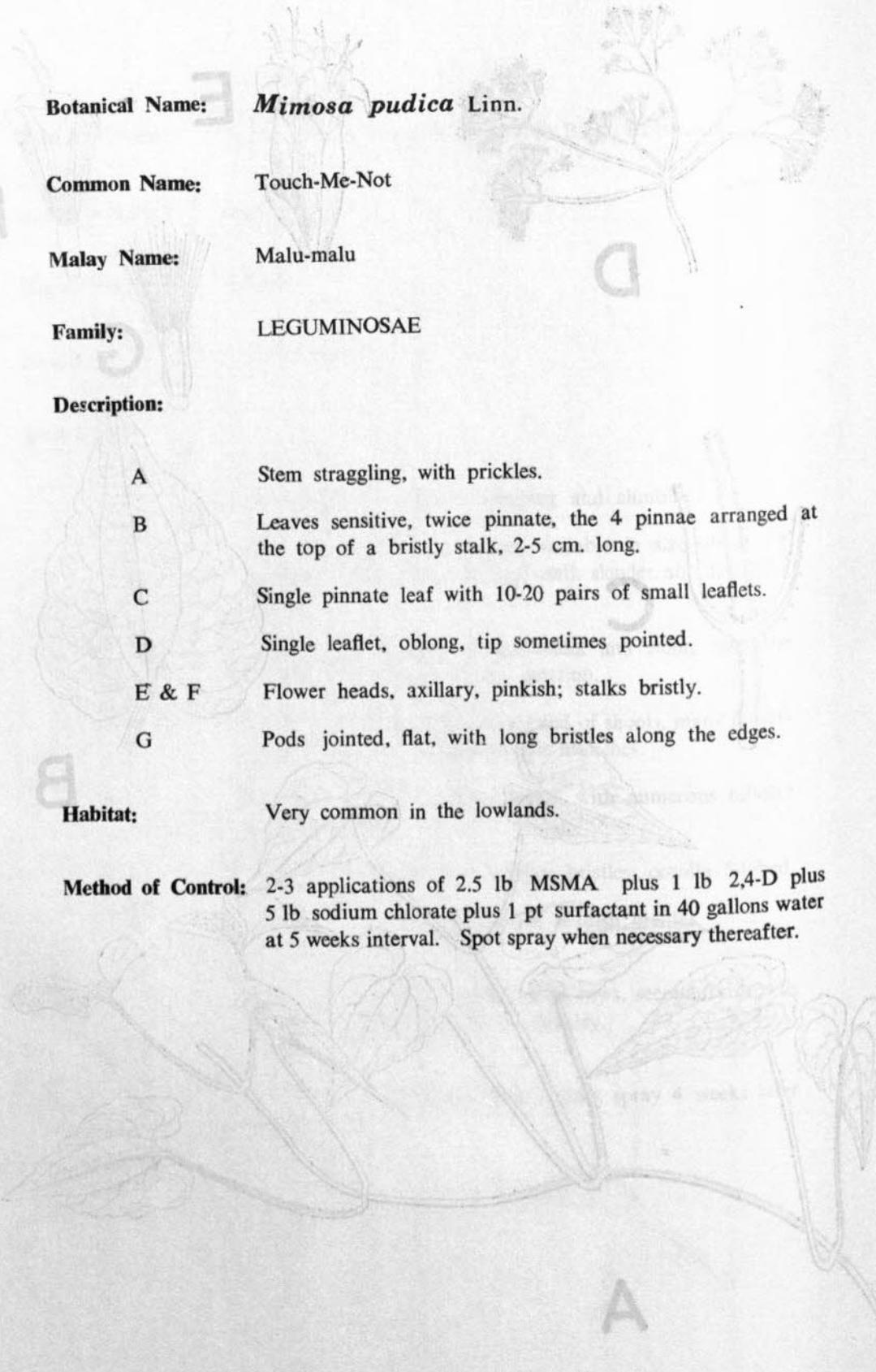
C



B



A



Botanical Name: *Mimosa pudica* Linn.

Common Name: Touch-Me-Not

Malay Name: Malu-malu

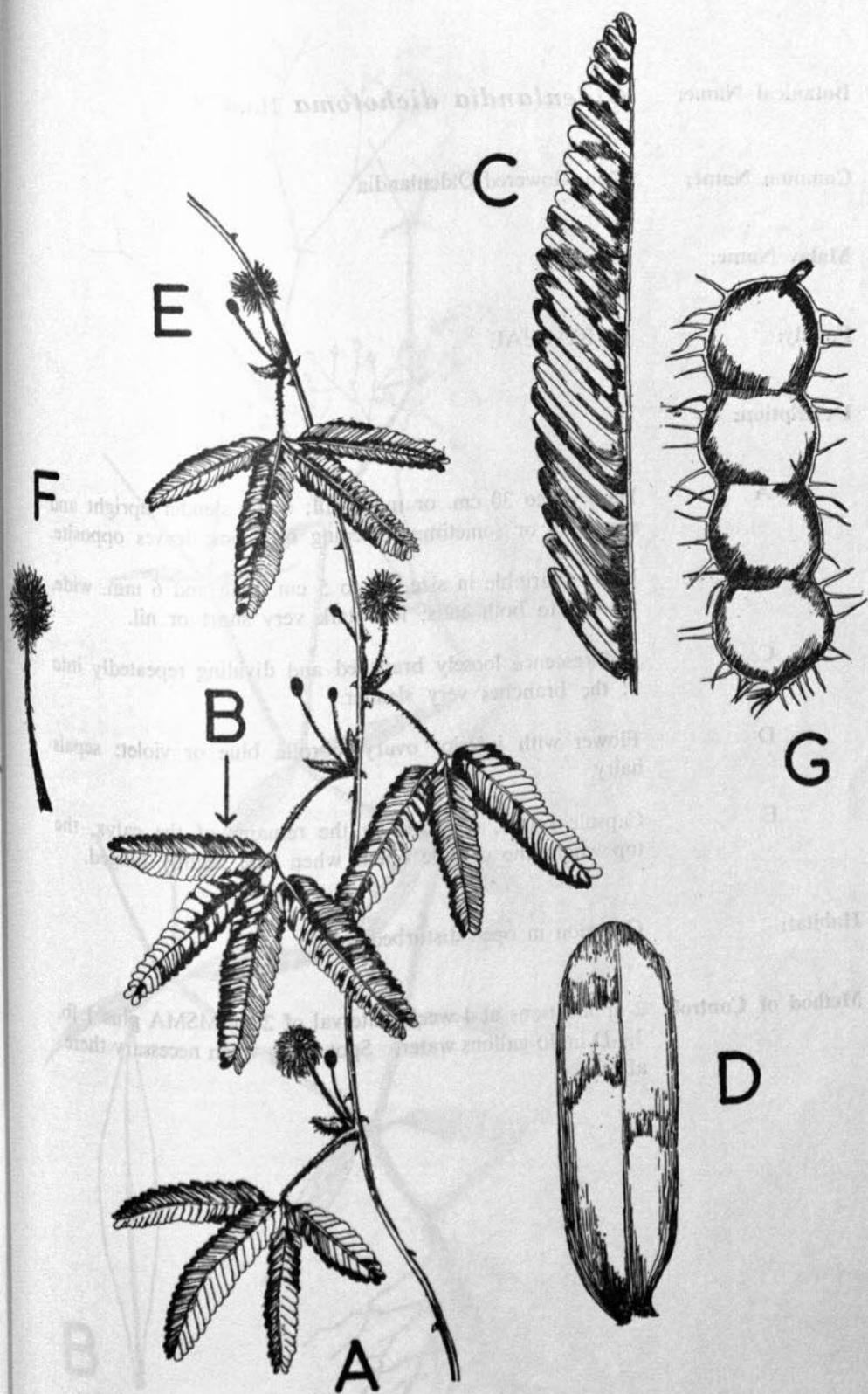
Family: LEGUMINOSAE

Description:

- A Stem straggling, with prickles.
- B Leaves sensitive, twice pinnate, the 4 pinnae arranged at the top of a bristly stalk, 2-5 cm. long.
- C Single pinnate leaf with 10-20 pairs of small leaflets.
- D Single leaflet, oblong, tip sometimes pointed.
- E & F Flower heads, axillary, pinkish; stalks bristly.
- G Pods jointed, flat, with long bristles along the edges.

Habitat: Very common in the lowlands.

Method of Control: 2-3 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate plus 1 pt surfactant in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Oldenlandia dichotoma* Hook f.

Common Name: Many-flowered Oldenlandia

Malay Name: Siku-siku

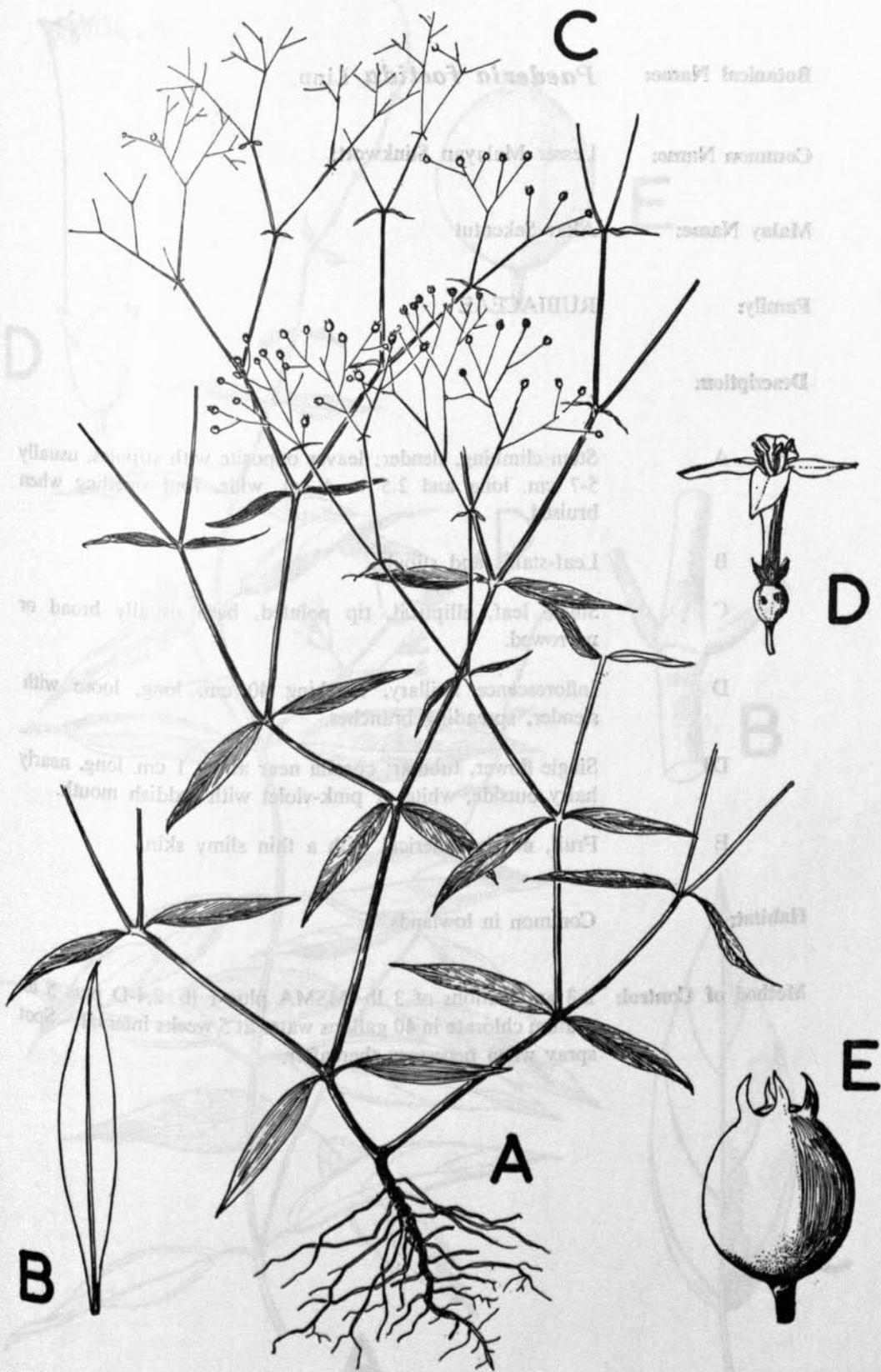
Family: RUBIACEAE

Description:

- A Herb up to 30 cm. or more tall; many slender upright and spreading or sometimes creeping branches; leaves opposite.
- B Leaves variable in size, up to 5 cm. long and 6 mm. wide, tapered to both ends; leaf-stalk very short or nil.
- C Inflorescence loosely branched and dividing repeatedly into 2; the branches very slender.
- D Flower with inferior ovary; corolla blue or violet; sepals hairy.
- E Capsule round, crowned by the remains of the calyx, the top where the capsule opens when ripe slightly bulged.

Habitat: Common in open disturbed soil.

Method of Control: 2 applications at 4 weeks interval of 2 lb. MSMA plus 1 lb. 2,4-D in 40 gallons water. Spot spray when necessary thereafter.



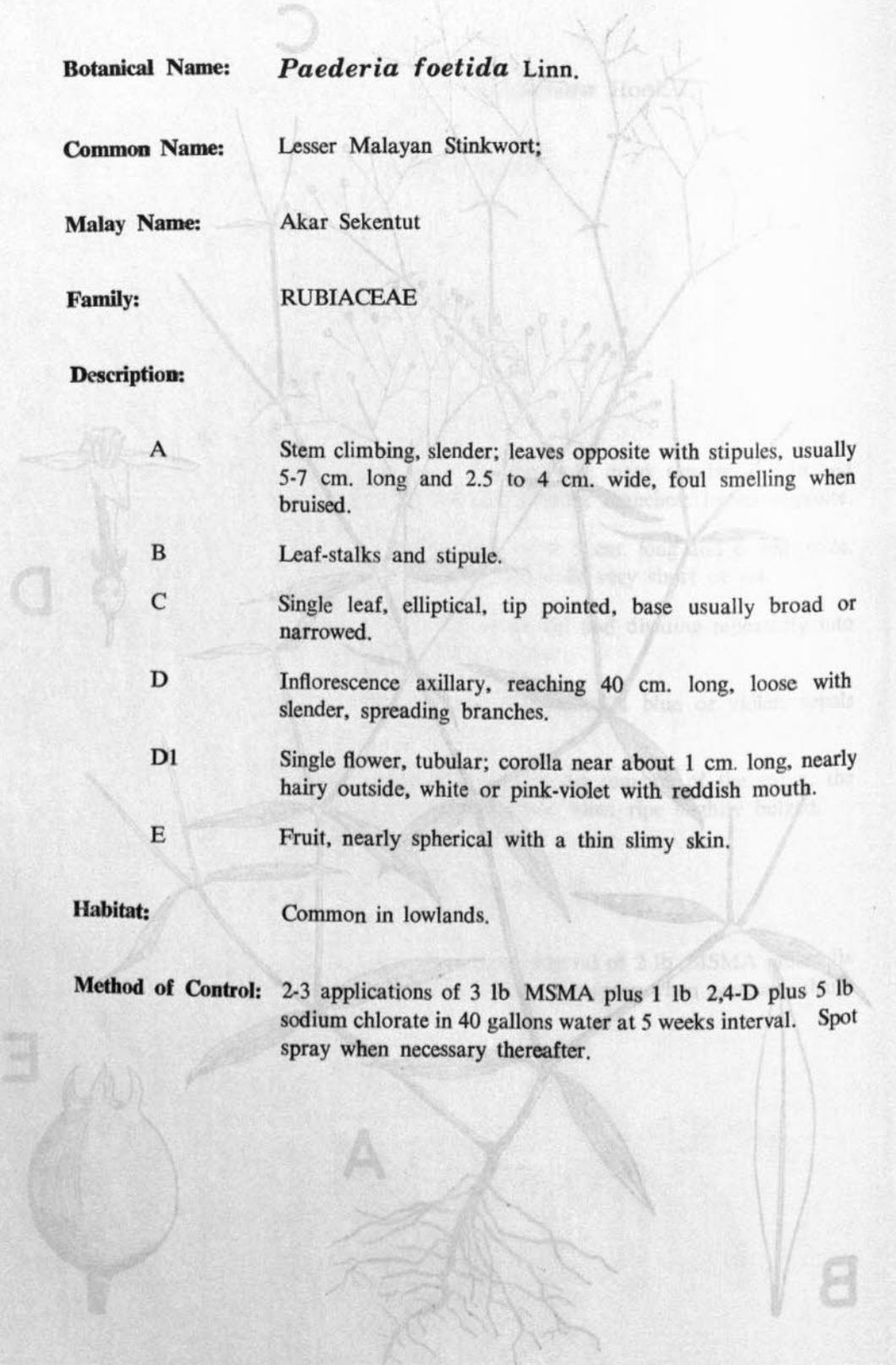
Botanical Name: *Paederia foetida* Linn.

Common Name: Lesser Malayan Stinkwort;

Malay Name: Akar Sekentut

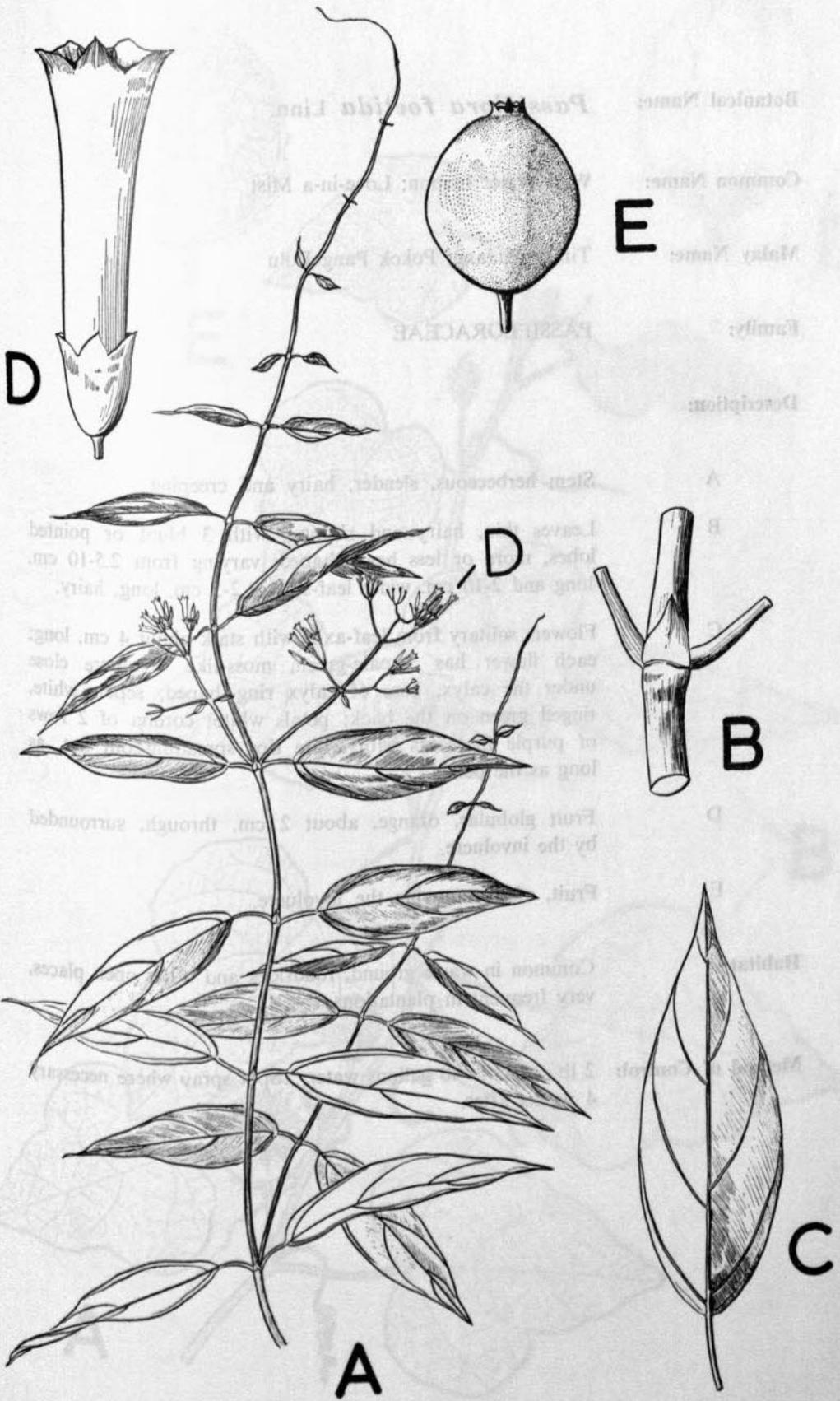
Family: RUBIACEAE

Description:

- 
- A Stem climbing, slender; leaves opposite with stipules, usually 5-7 cm. long and 2.5 to 4 cm. wide, foul smelling when bruised.
- B Leaf-stalks and stipule.
- C Single leaf, elliptical, tip pointed, base usually broad or narrowed.
- D Inflorescence axillary, reaching 40 cm. long, loose with slender, spreading branches.
- D1 Single flower, tubular; corolla near about 1 cm. long, nearly hairy outside, white or pink-violet with reddish mouth.
- E Fruit, nearly spherical with a thin slimy skin.

Habitat: Common in lowlands.

Method of Control: 2-3 applications of 3 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Passiflora foetida* Linn.

Common Name: Wild Water Lemon; Love-in-a Mist

Malay Name: Timun Padang; Pokok Pang Bulu

Family: PASSIFLORACEAE

Description:

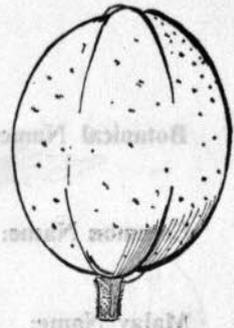
- A Stem herbeceous, slender, hairy and creeping.
- B Leaves thin, hairy and shining, with 3 blunt or pointed lobes, more or less heart-shaped, varying from 2.5-10 cm. long and 2-10 cm. wide; leaf-stalk 1.2-5 cm. long, hairy.
- C Flowers solitary from leaf-axils with stalk about 4 cm. long; each flower has 3 pale-green, moss-like involucre close under the calyx, base of calyx ring-shaped; sepals white, tinged green on the back; petals white; corona of 2 rows of purple filaments with white tips spreading out flat, as long as the petals.
- D Fruit globular, orange, about 2 cm. through, surrounded by the involucre.
- E Fruit, after removing the involucre.

Habitat: Common in waste ground, roadsides and other open places, very frequent in plantations.

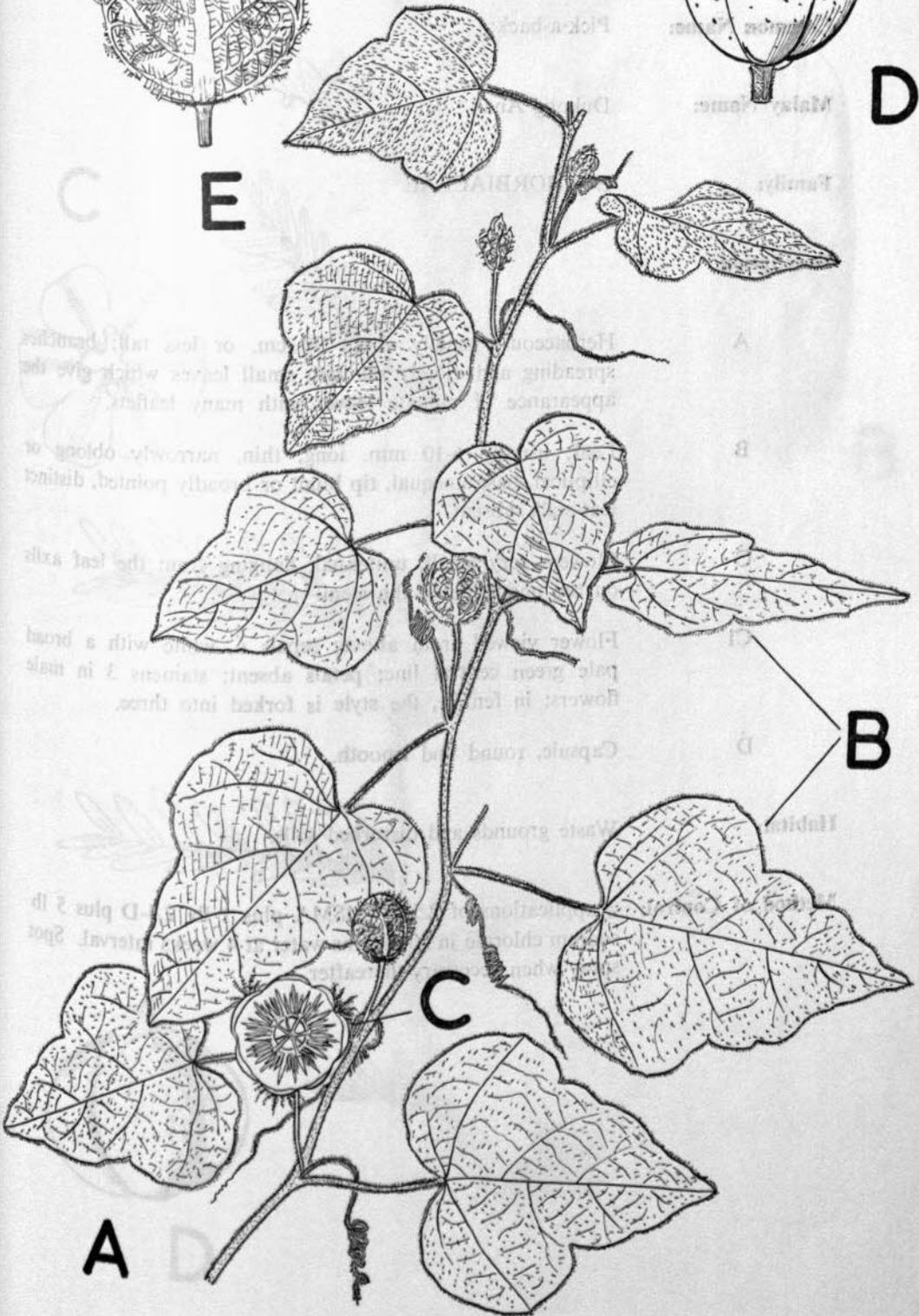
Method of Control: 2 lb 2,4-D in 40 gallons water. Spot spray where necessary 4 weeks after.



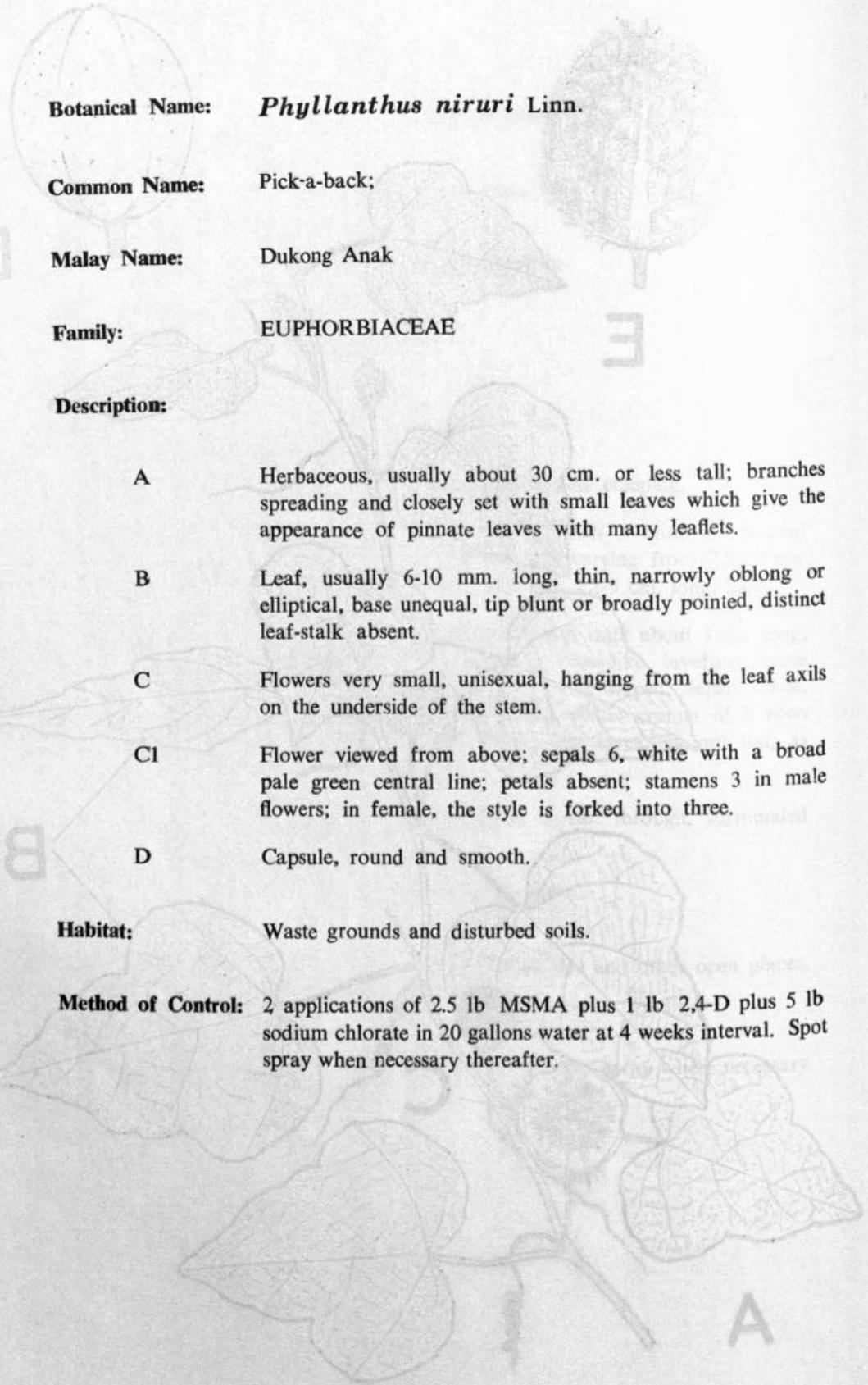
E



D



A



Botanical Name: *Phyllanthus niruri* Linn.

Common Name: Pick-a-back;

Malay Name: Dukong Anak

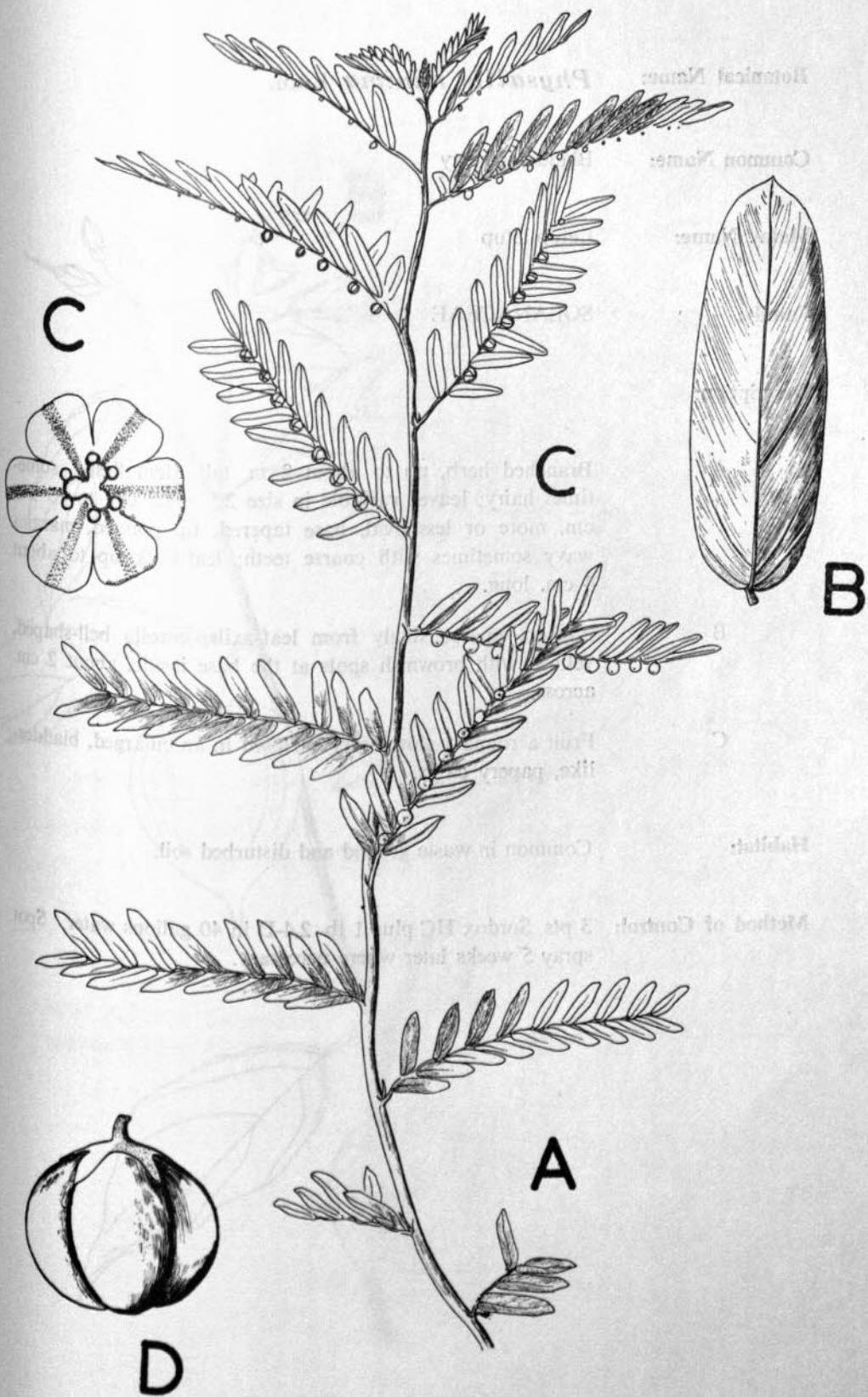
Family: EUPHORBIACEAE

Description:

- A Herbaceous, usually about 30 cm. or less tall; branches spreading and closely set with small leaves which give the appearance of pinnate leaves with many leaflets.
- B Leaf, usually 6-10 mm. long, thin, narrowly oblong or elliptical, base unequal, tip blunt or broadly pointed, distinct leaf-stalk absent.
- C Flowers very small, unisexual, hanging from the leaf axils on the underside of the stem.
- CI Flower viewed from above; sepals 6, white with a broad pale green central line; petals absent; stamens 3 in male flowers; in female, the style is forked into three.
- D Capsule, round and smooth.

Habitat: Waste grounds and disturbed soils.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 20 gallons water at 4 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Physallis minima* Linn.

Common Name: Bladder Cherry

Malay Name: Letup-letup

Family: SOLANACEAE

Description:

A

Branched herb, up to about 2 m. tall, stem fleshy, sometimes hairy; leaves variable in size 2.5 x 1.2 cm. to 13 x 8 cm. more or less oval, base tapered, tip pointed, margins wavy sometimes with coarse teeth; leaf-stalk up to about 4 cm. long.

B

Flowers emerge singly from leaf-axils; corolla bell-shaped, yellow, with brownish spots at the base inside, about 2 cm. across.

C

Fruit a round yellow berry enclosed in an enlarged, bladder-like, papery calyx.

Habitat: Common in waste ground and disturbed soil.

Method of Control: 3 pts Sordox HC plus 1 lb 2,4-D in 40 gallons water. Spot spray 5 weeks later where necessary.

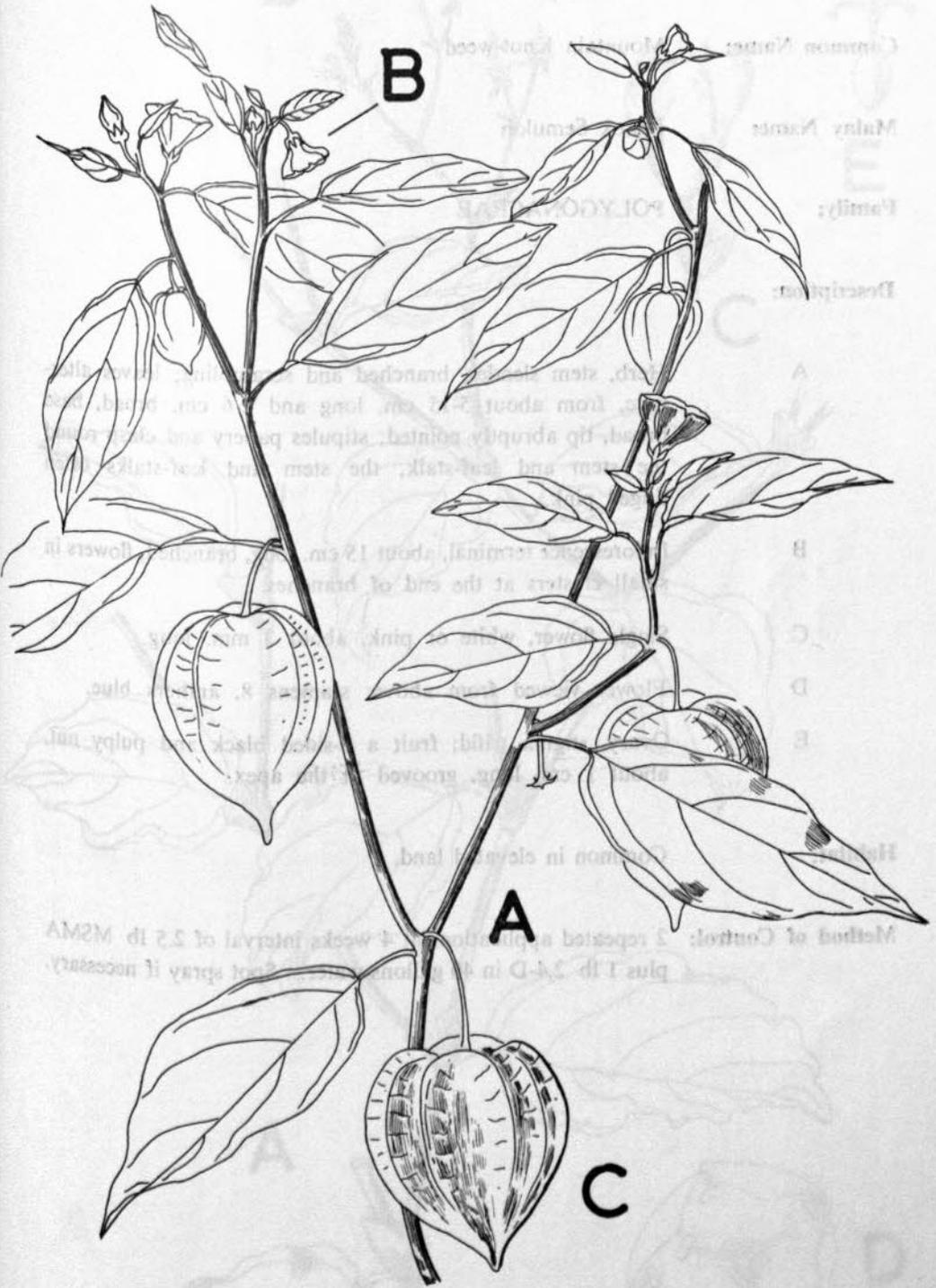
Botanical Name: *Polygonum chinense* Linn.

Common Name: Knotweed

Main Name:

Family:

Description:



Method of Control: 2 repeated applications at 4 weeks interval of 2.5 lb MSM plus 1 lb 2,4-D in 100 gallons of water and spray if necessary.

Botanical Name: *Polygonum chinense* Linn.

Common Name: Mountain Knot-weed

Malay Name: Pokok Semuloh

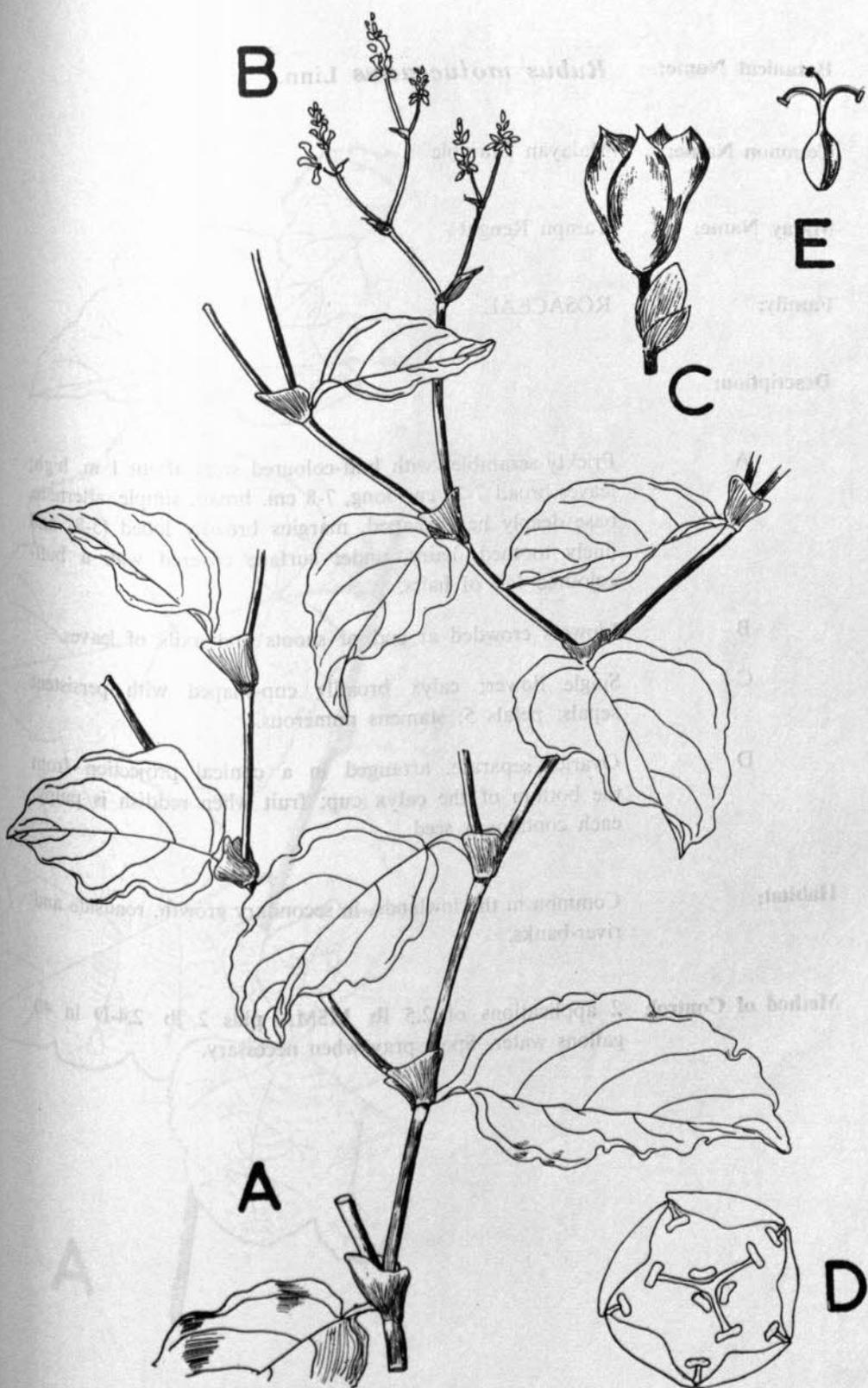
Family: POLYGONACEAE

Description:

- A Herb, stem slender, branched and scrambling; leaves alternate, from about 5-15 cm. long and 2-6 cm. broad, base broad, tip abruptly pointed; stipules papery and clasp round the stem and leaf-stalk, the stem and leaf-stalks often tinged pink.
- B Inflorescence terminal, about 15 cm. long, branched, flowers in small clusters at the end of branches.
- C Single flower, white or pink, about 3 mm. long.
- D Flower viewed from above; stamens 8, anthers blue.
- E Ovary, stigma trifid; fruit a 3-sided black and pulpy nut, about 1 cm. long, grooved at the apex.

Habitat: Common in elevated land.

Method of Control: 2 repeated applications at 4 weeks interval of 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray if necessary.



Botanical Name: *Rubus moluccanus* Linn.

Common Name: Malayan Bramble

Malay Name: Tampu Rengat

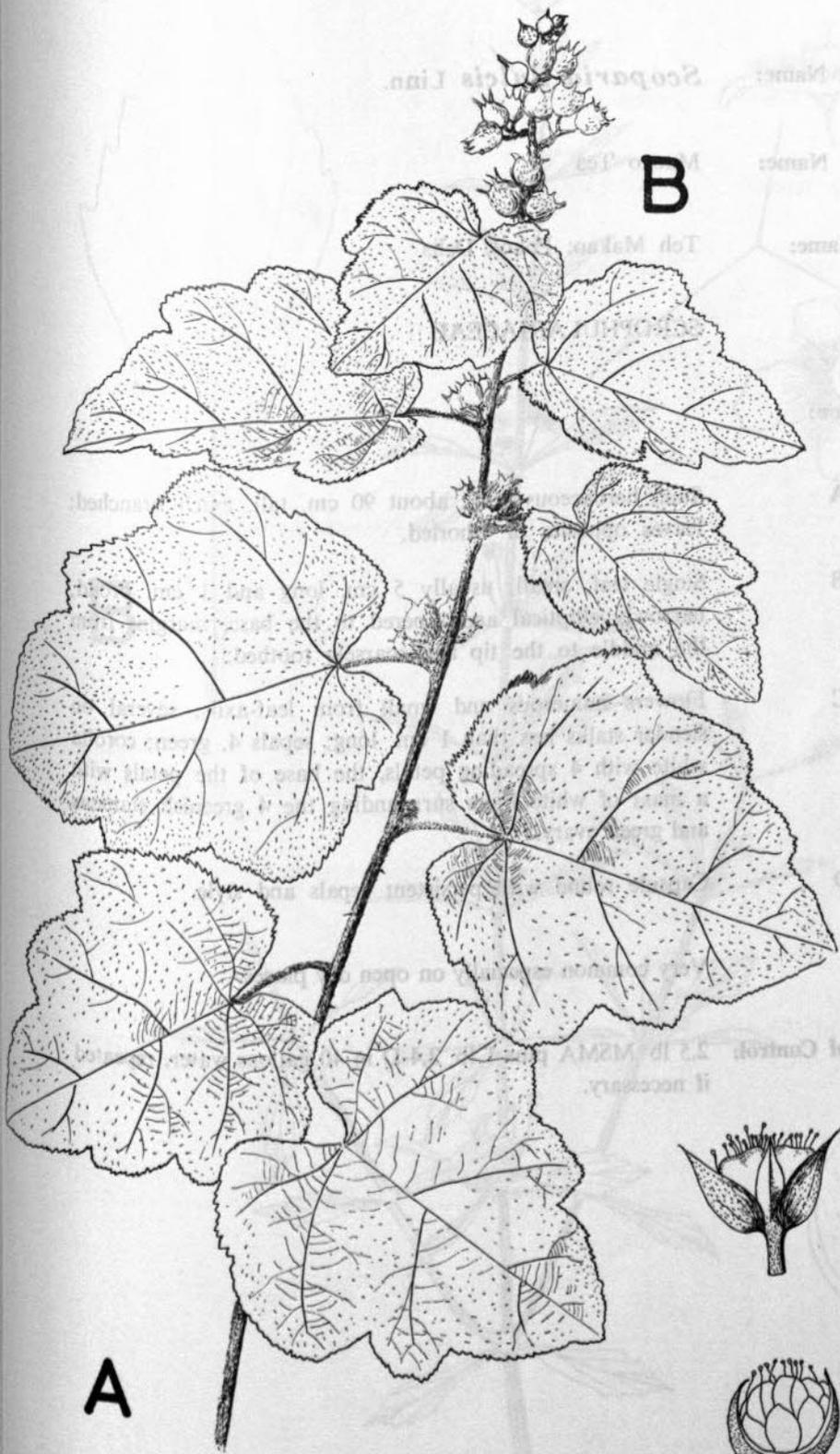
Family: ROSACEAE

Description:

- A Prickly scrambler with buff-coloured stem about 1 m. high; leaves broad 7-20 cm. long, 7-8 cm. broad, simple, alternate, base deeply heart-shaped, margins broadly lobed (3-8) and finely toothed, hairy, under surface covered with a buff-coloured felt of hairs.
- B Flowers crowded at end of shoots and axils of leaves.
- C Single flower; calyx broadly cup-shaped with persistent sepals; petals 5; stamens numerous.
- D Ovaries separate, arranged in a conical projection from the bottom of the calyx cup; fruit when reddish is pulpy, each contains a seed.

Habitat: Common in the lowlands, in secondary growth, roadside and river-banks.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water. Spot spray when necessary.



B

A



C



D

Botanical Name: *Scoparia dulcis* Linn.

Common Name: Macao Tea

Malay Name: Teh Makao; Pokok Delis

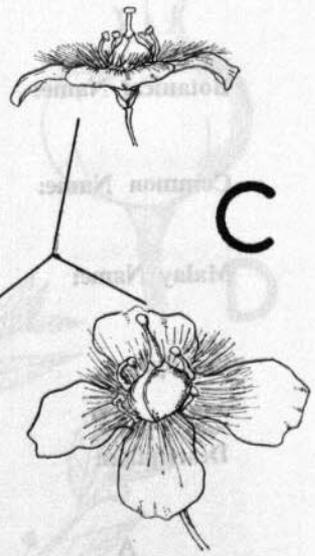
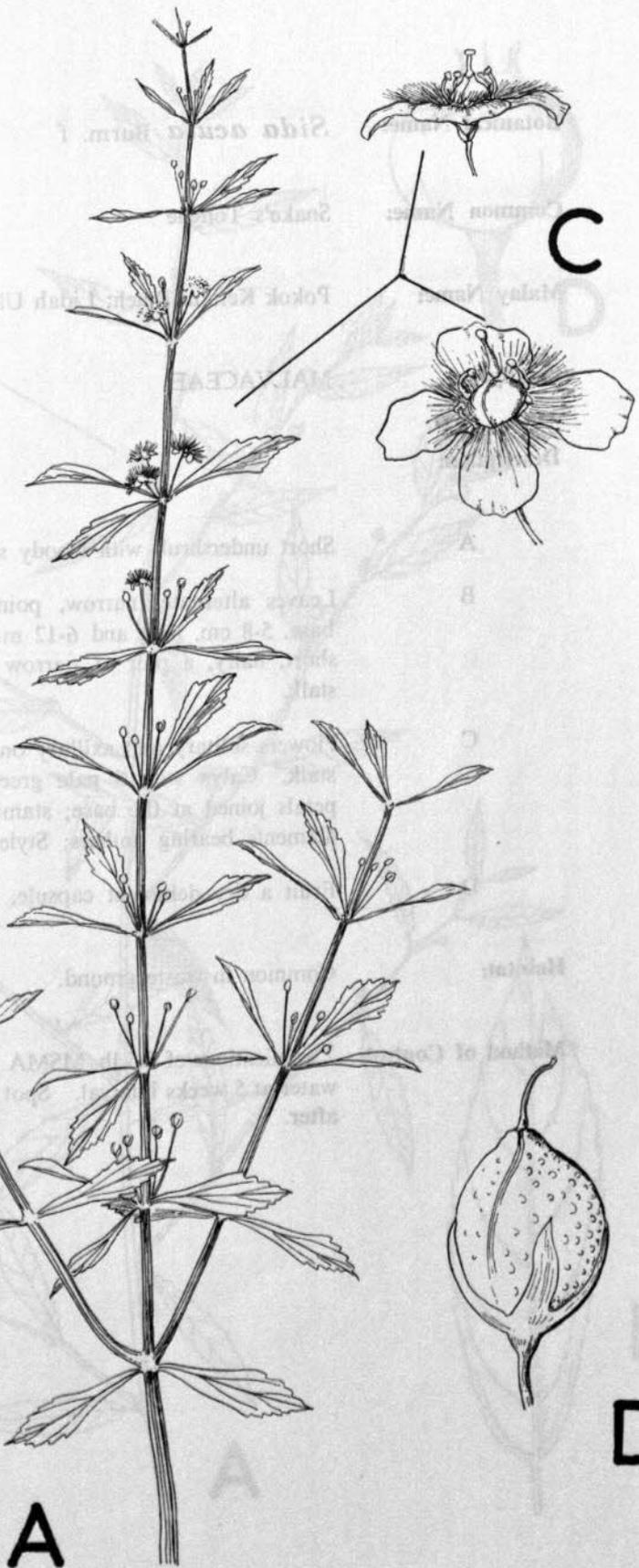
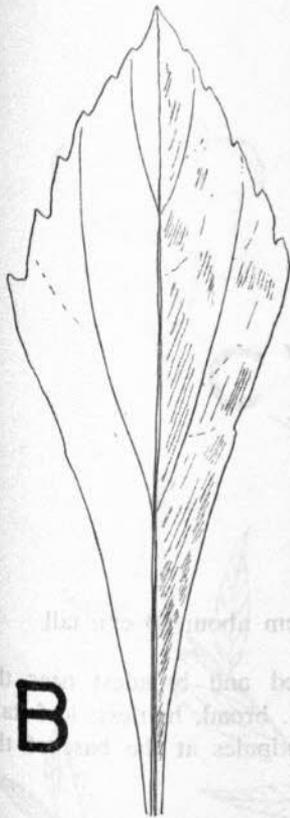
Family: SCROPHULARIACEAE

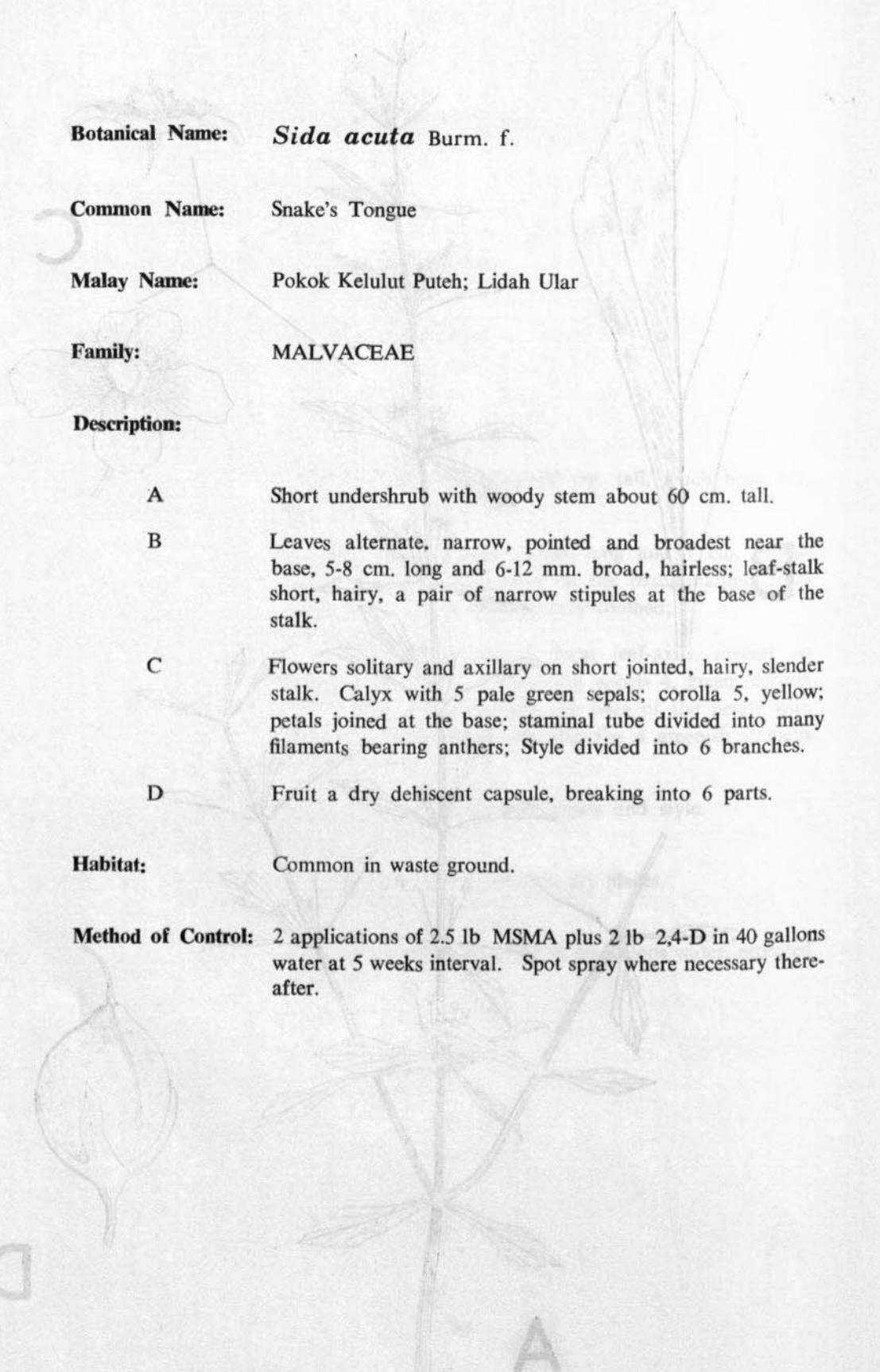
Description:

- A Stem herbaceous wiry, about 90 cm. tall, much branched; leaves opposite or whorled.
- B Single leaf, small, usually 5 cm. long and 1 cm. broad, narrowly elliptical and tapered to the base, margins from the middle to the tip are coarsely toothed;
- C Flowers numerous and small from leaf-axils, several on slender stalks less than 1 cm. long; sepals 4, green; corolla white with 4 spreading petals, the base of the petals with a mass of white hairs surrounding the 4 greenish stamens and green ovary.
- D Capsule round with persistent sepals and style.

Habitat: Very common especially on open dry places.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water, repeated if necessary.





Botanical Name: *Sida acuta* Burm. f.

Common Name: Snake's Tongue

Malay Name: Pokok Kelulut Puteh; Lidah Ular

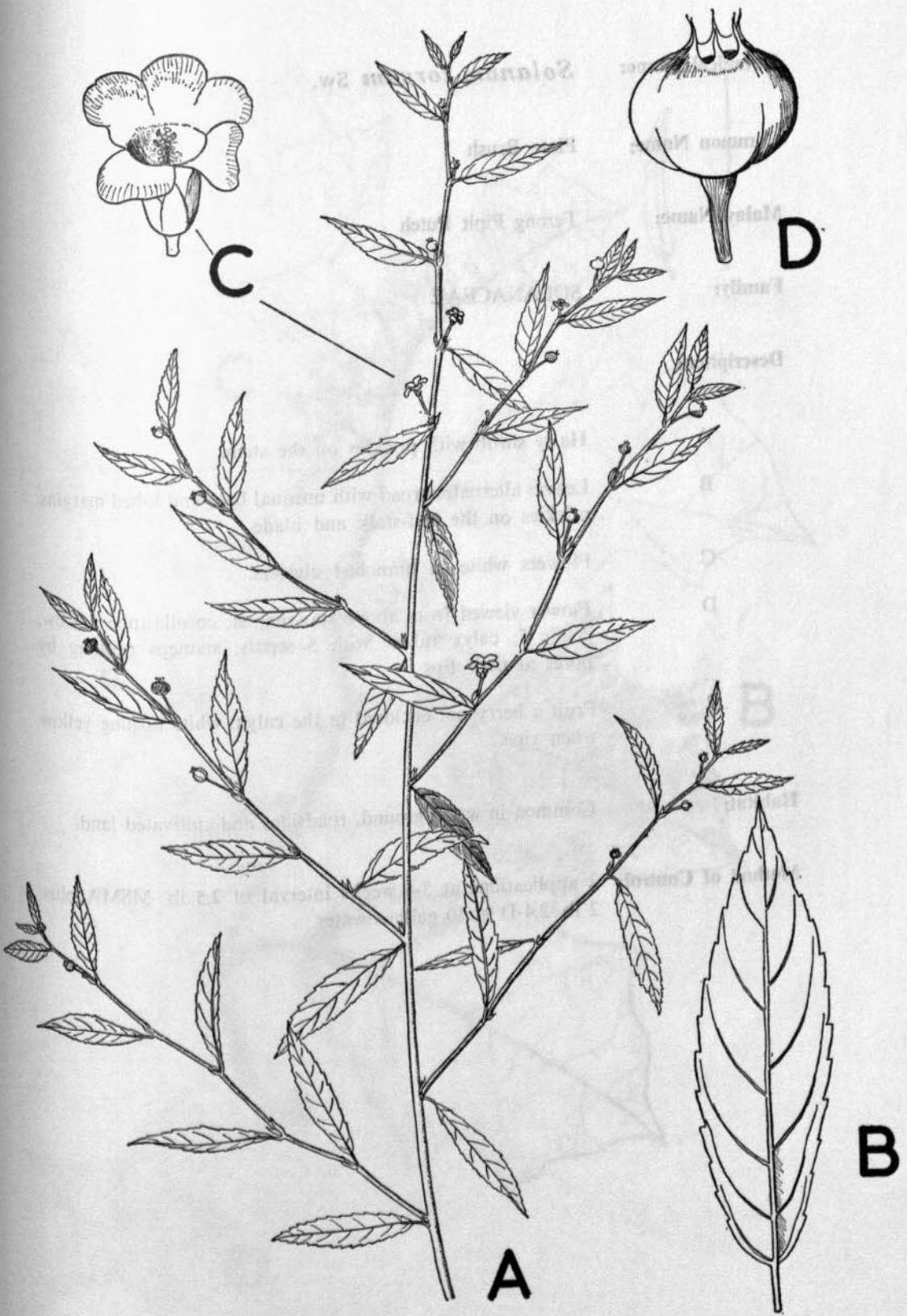
Family: MALVACEAE

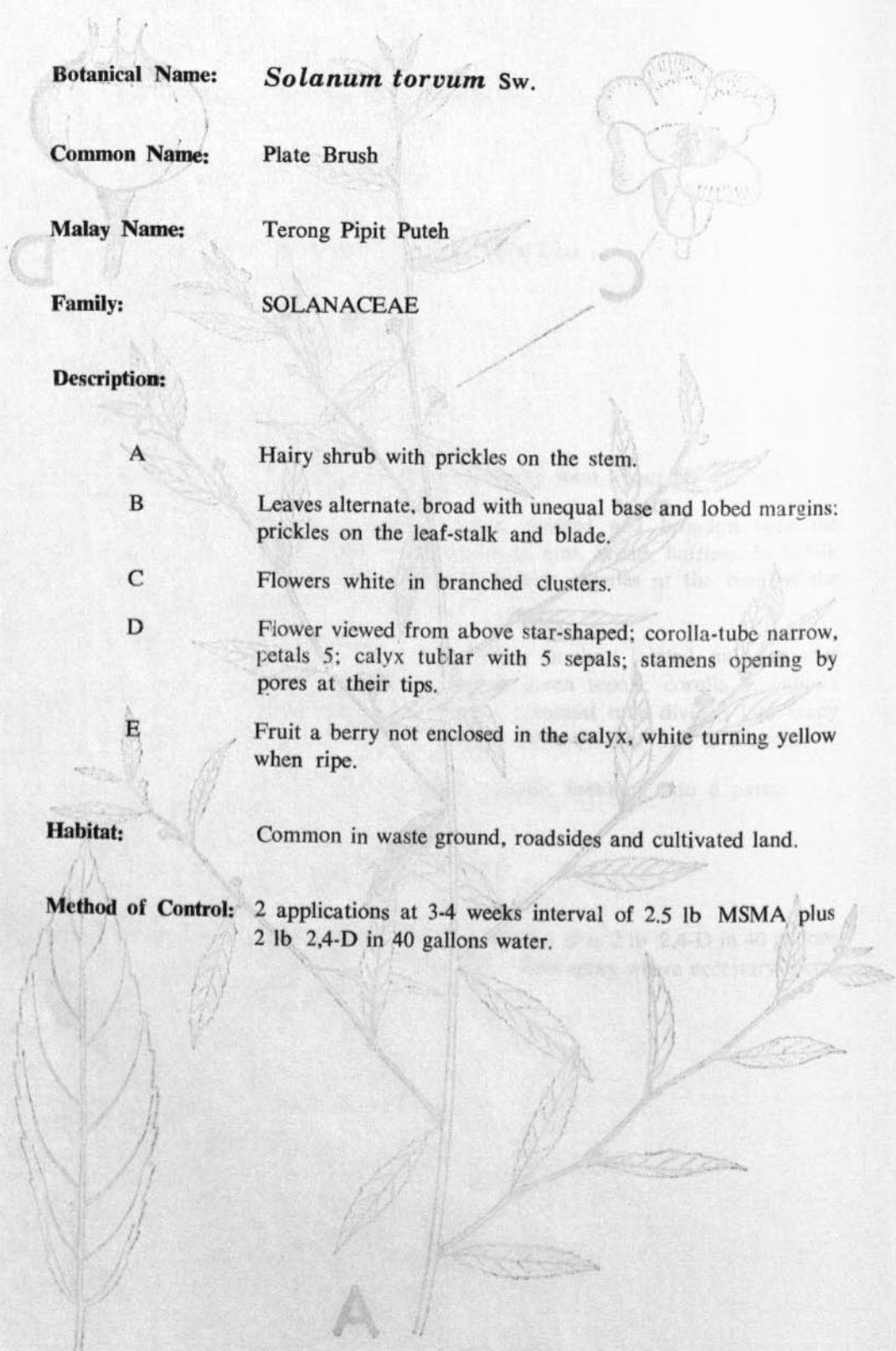
Description:

- A Short undershrub with woody stem about 60 cm. tall.
- B Leaves alternate, narrow, pointed and broadest near the base, 5-8 cm. long and 6-12 mm. broad, hairless; leaf-stalk short, hairy, a pair of narrow stipules at the base of the stalk.
- C Flowers solitary and axillary on short jointed, hairy, slender stalk. Calyx with 5 pale green sepals; corolla 5, yellow; petals joined at the base; staminal tube divided into many filaments bearing anthers; Style divided into 6 branches.
- D Fruit a dry dehiscent capsule, breaking into 6 parts.

Habitat: Common in waste ground.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water at 5 weeks interval. Spot spray where necessary thereafter.





Botanical Name: *Solanum torvum* Sw.

Common Name: Plate Brush

Malay Name: Terong Pipit Puteh

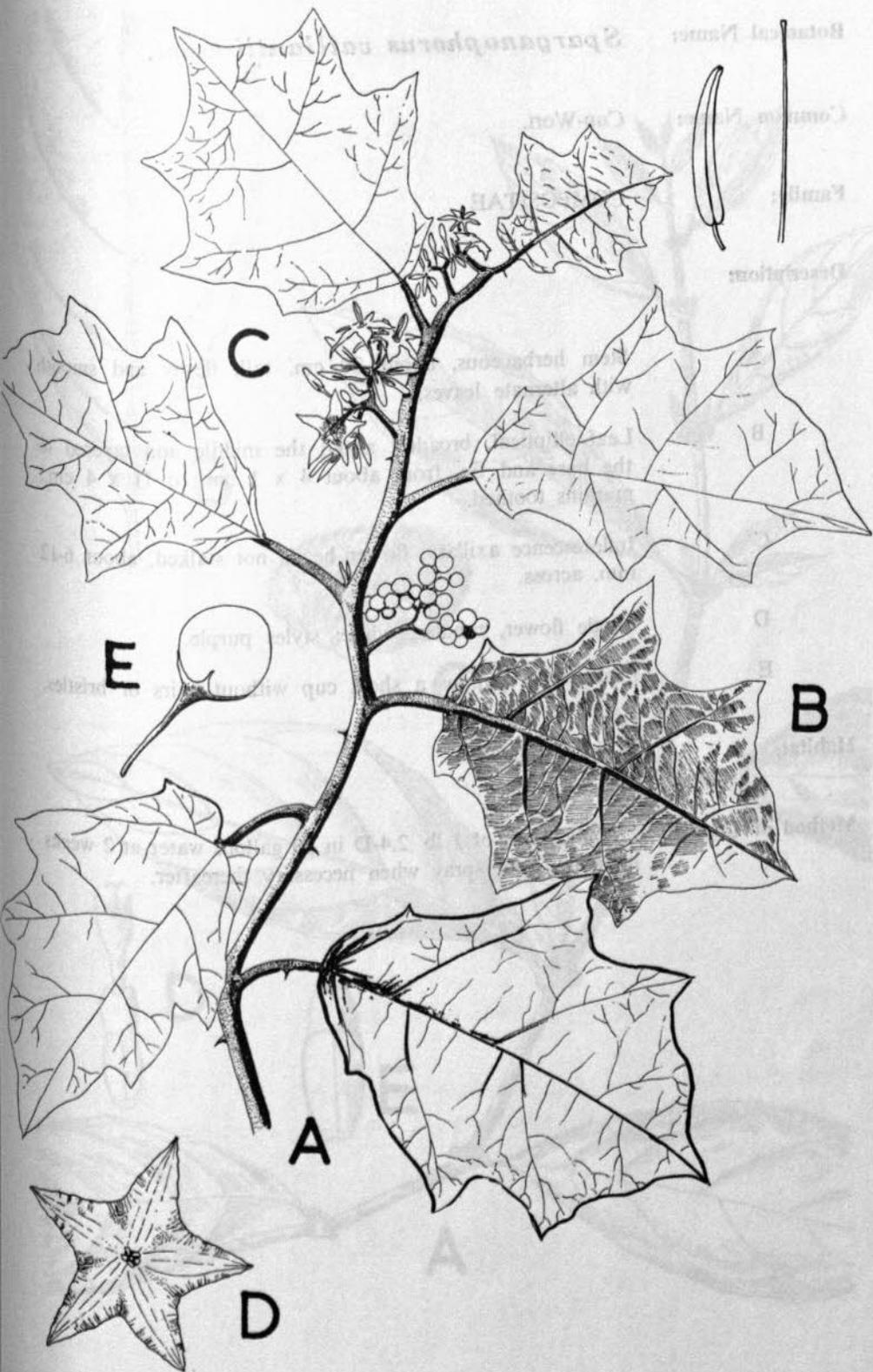
Family: SOLANACEAE

Description:

- A Hairy shrub with prickles on the stem.
- B Leaves alternate, broad with unequal base and lobed margins; prickles on the leaf-stalk and blade.
- C Flowers white in branched clusters.
- D Flower viewed from above star-shaped; corolla-tube narrow, petals 5; calyx tubular with 5 sepals; stamens opening by pores at their tips.
- E Fruit a berry not enclosed in the calyx, white turning yellow when ripe.

Habitat: Common in waste ground, roadsides and cultivated land.

Method of Control: 2 applications at 3-4 weeks interval of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water.



Botanical Name: *Sparganophorus vaillantii* Craz.

Common Name: Cup-Wort.

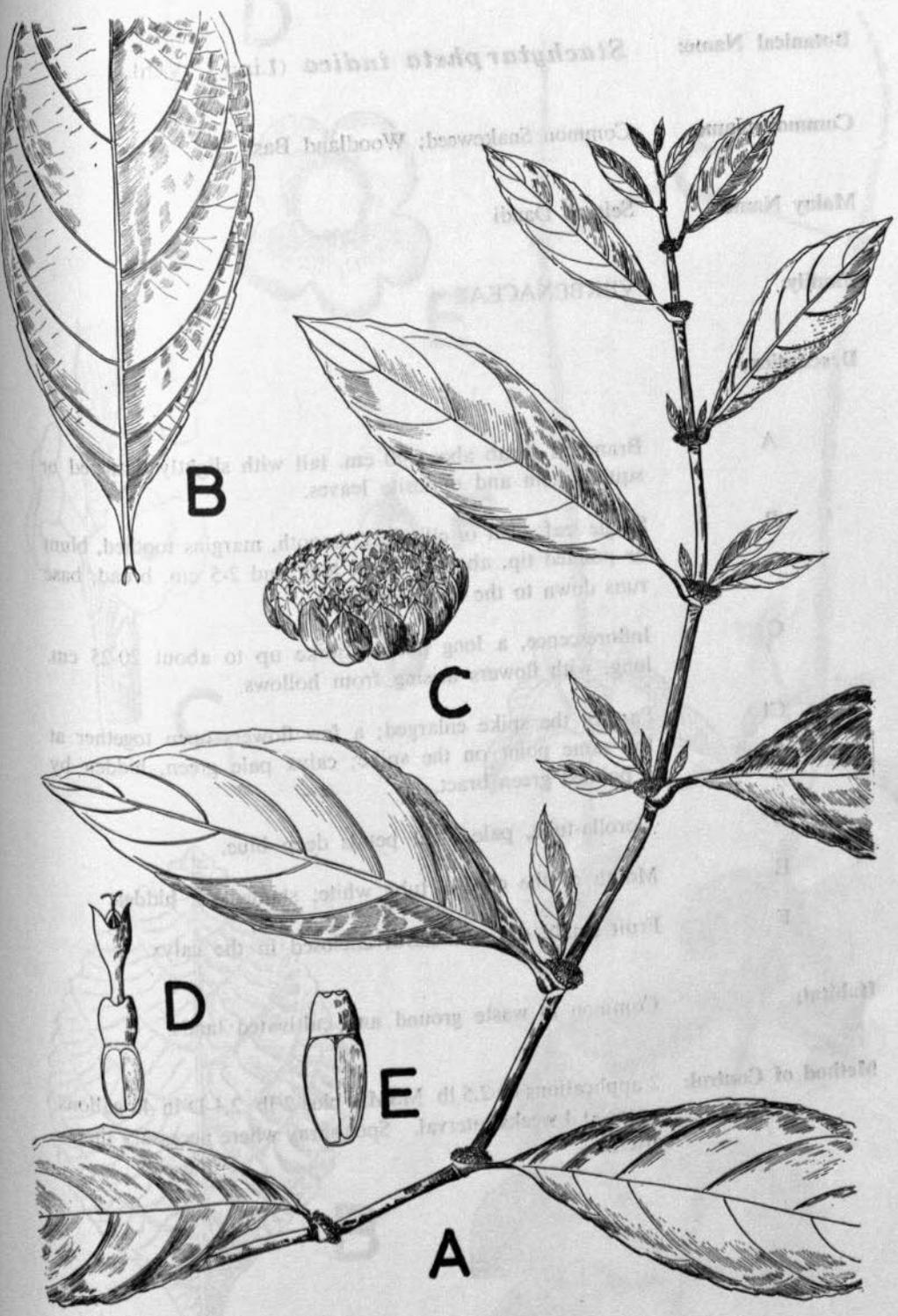
Family: COMPOSITAE.

Description:

- A Stem herbaceous, about 30 cm. tall, fleshy and smooth with alternate leaves.
- B Leaf elliptical, broadest about the middle and tapered to the base and tip, from about 4 x 1 cm. to 11 x 4 cm.; margins toothed.
- C Inflorescence axillary, flower heads not stalked, about 6-12 mm. across.
- D Single flower, tubular, white; styles purple.
- E Fruit white, pappus a short cup without hairs or bristles.

Habitat: In damp places.

Method of Control: 2 applications of 1 lb 2,4-D in 20 gallons water at 2 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Stachytarpheta indica* (Linn.) Vahl.

Common Name: Common Snakeweed; Woodland Basil

Malay Name: Selaseh Dandi

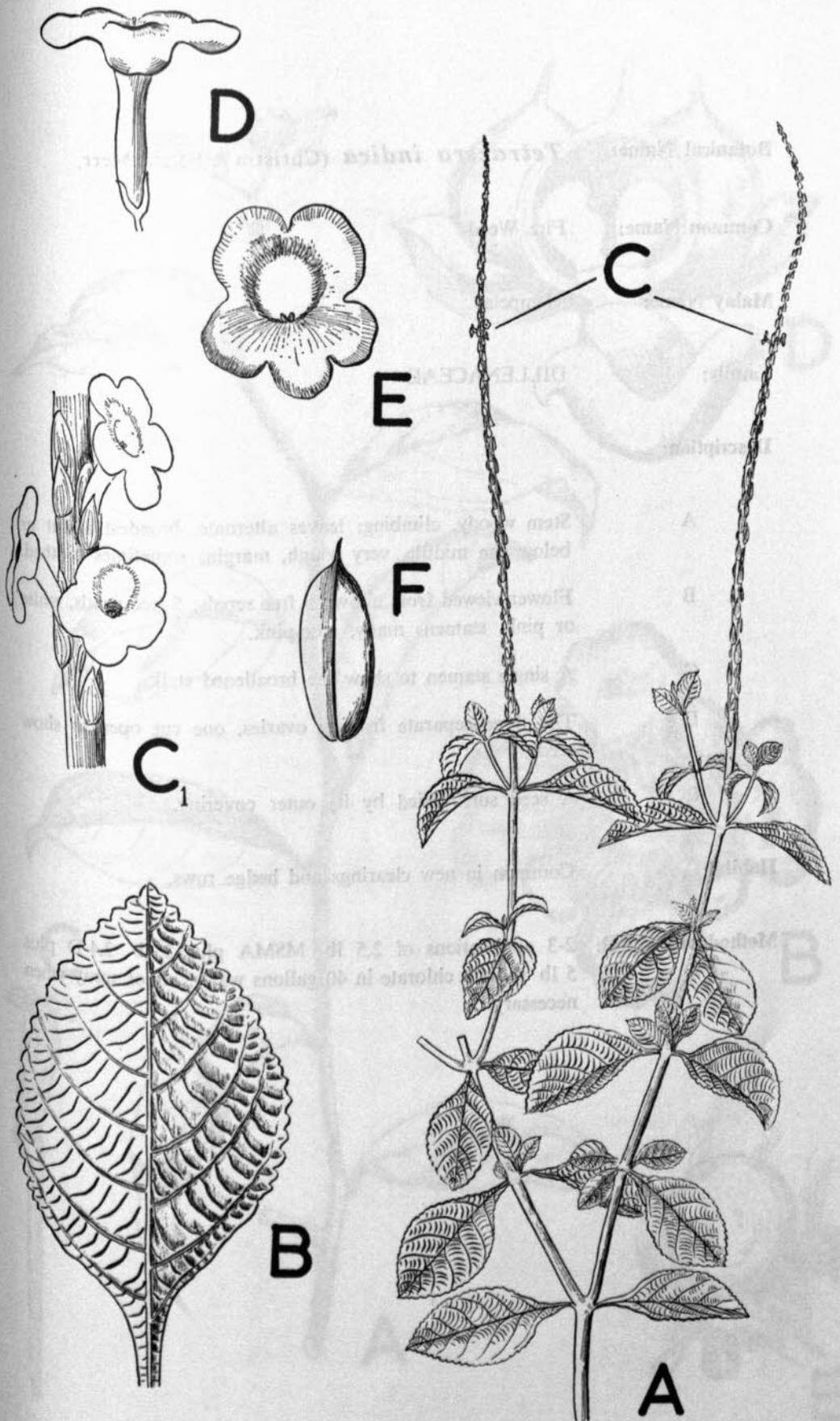
Family: VERBENACEAE

Description:

- A Branched shrub about 90 cm. tall with slightly flattened or square stem and opposite leaves.
- B Single leaf; oval or elliptical, smooth, margins toothed, blunt or pointed tip, about 5-8 cm. long and 2-5 cm. broad, base runs down to the short leaf-stalk.
- C Inflorescence, a long narrow spike up to about 20-25 cm. long, with flowers arising from hollows.
- Cl Part of the spike enlarged; a few flowers open together at the same point on the spike; calyx pale green, hidden by a pointed green bract.
- D Corolla-tube, pale blue; petals deep blue.
- E Mouth of the corolla tube white; stamens 2, hidden.
- F Fruit small, dry and hard, enclosed in the calyx.

Habitat: Common in waste ground and cultivated lands.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water at 4 weeks interval. Spot spray where necessary thereafter.



Botanical Name: *Tetracera indica* (Christm & Panz.) Merr.

Common Name: Fire Weed

Malay Name: Mempelas

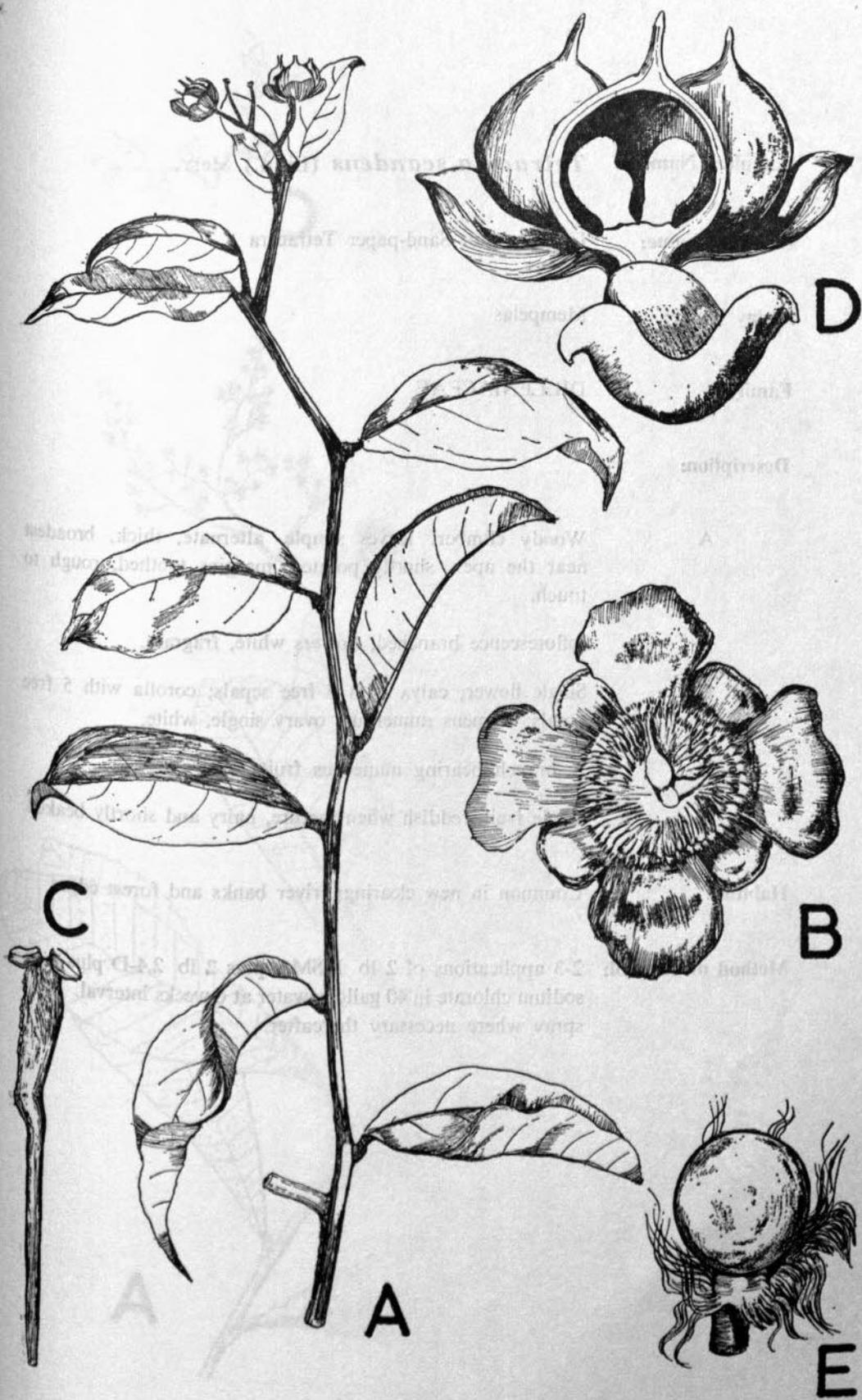
Family: DILLENACEAE

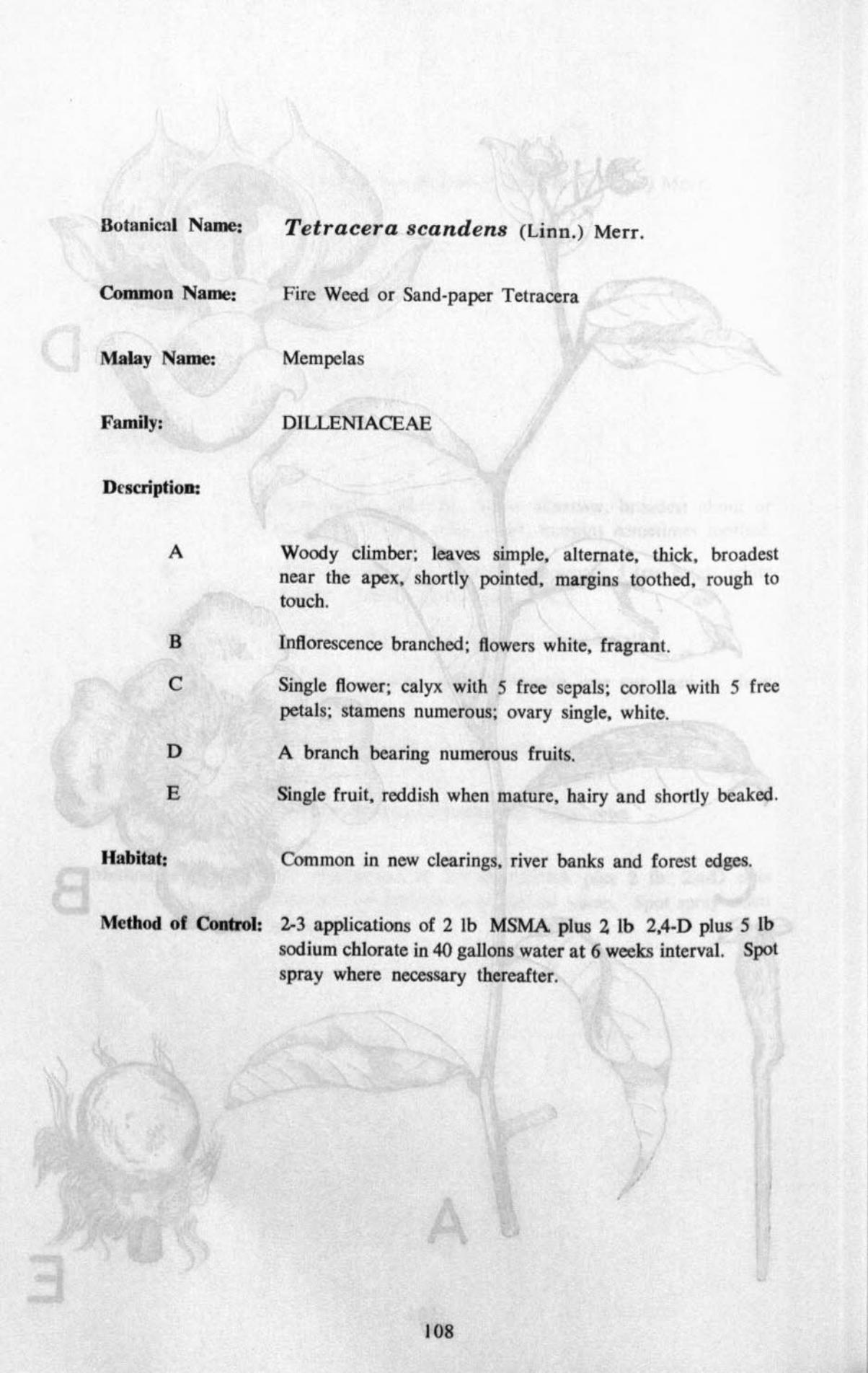
Description:

- A Stem woody, climbing; leaves alternate, broadest about or below the middle, very rough, margins sometimes toothed.
- B Flower viewed from above; 5 free sepals; 5 free petals, white or pink; stamens many, rose-pink.
- C A single stamen to show the broadened stalk.
- D The three separate fruiting ovaries, one cut open to show seeds.
- E A seed surrounded by its outer covering.

Habitat: Common in new clearings and hedge rows.

Method of Control: 2-3 applications of 2.5 lb MSMA plus 2 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water. Spot spray when necessary.



A detailed botanical illustration of the plant *Tetracera scandens*. The main drawing shows a woody climber with several large, simple, alternate leaves that are thick and have a toothed margin. At the top of the stem is a branched inflorescence with several flowers. Below the main illustration, there are five smaller, detailed drawings labeled A through E. Drawing A shows a branch with several leaves. Drawing B shows a close-up of the inflorescence. Drawing C shows a single flower with its calyx and corolla. Drawing D shows a single fruit. Drawing E shows a close-up of a fruit with its beak.

Botanical Name: *Tetracera scandens* (Linn.) Merr.

Common Name: Fire Weed or Sand-paper Tetracera

Malay Name: Mempelas

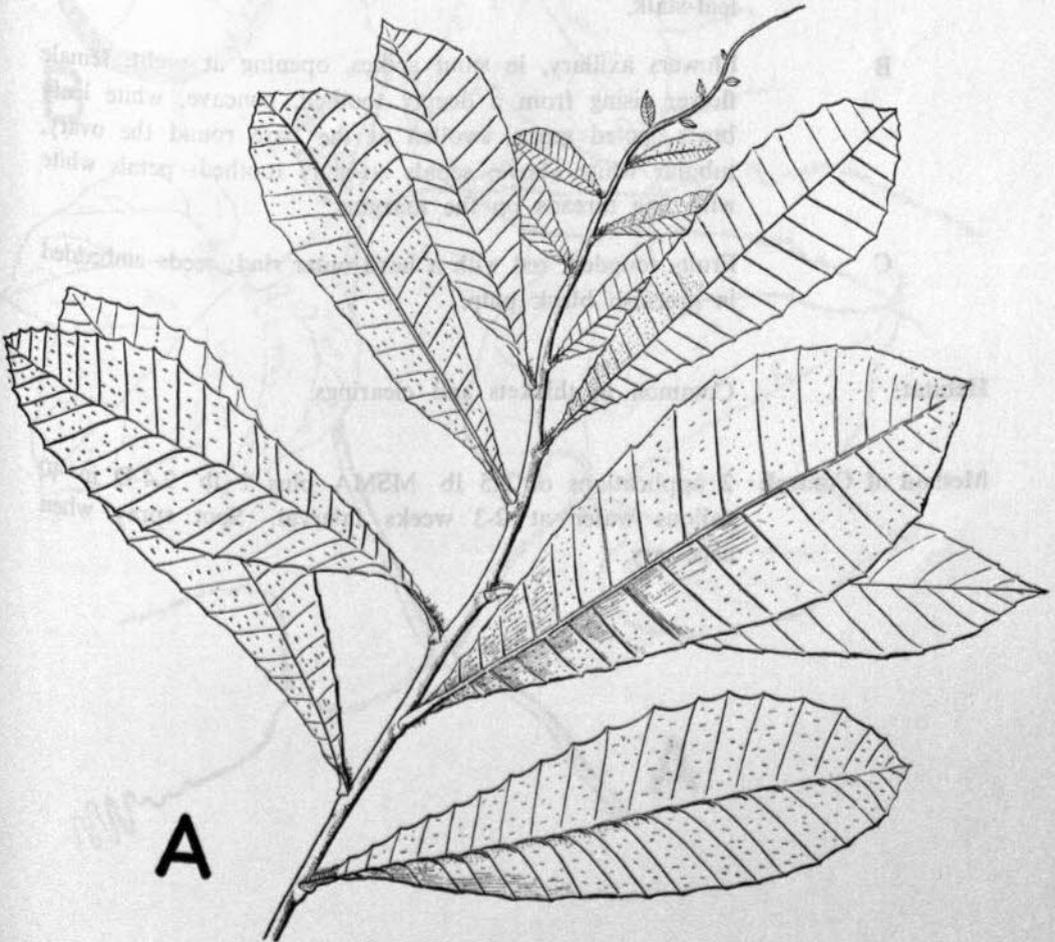
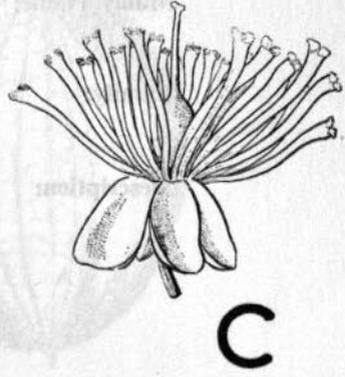
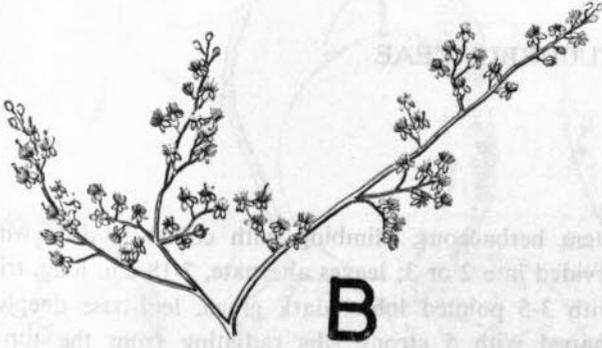
Family: DILLENiaceae

Description:

- A Woody climber; leaves simple, alternate, thick, broadest near the apex, shortly pointed, margins toothed, rough to touch.
- B Inflorescence branched; flowers white, fragrant.
- C Single flower; calyx with 5 free sepals; corolla with 5 free petals; stamens numerous; ovary single, white.
- D A branch bearing numerous fruits.
- E Single fruit, reddish when mature, hairy and shortly beaked.

Habitat: Common in new clearings, river banks and forest edges.

Method of Control: 2-3 applications of 2 lb MSMA plus 2 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 6 weeks interval. Spot spray where necessary thereafter.



Botanical Name: *Trichosanthes wallichiana* Wight

Common Name: Crow's Cucumber

Malay Name: Akar Timum Gagak; Akar Labu Ayer

Family: CUCURBITACEAE

Description:

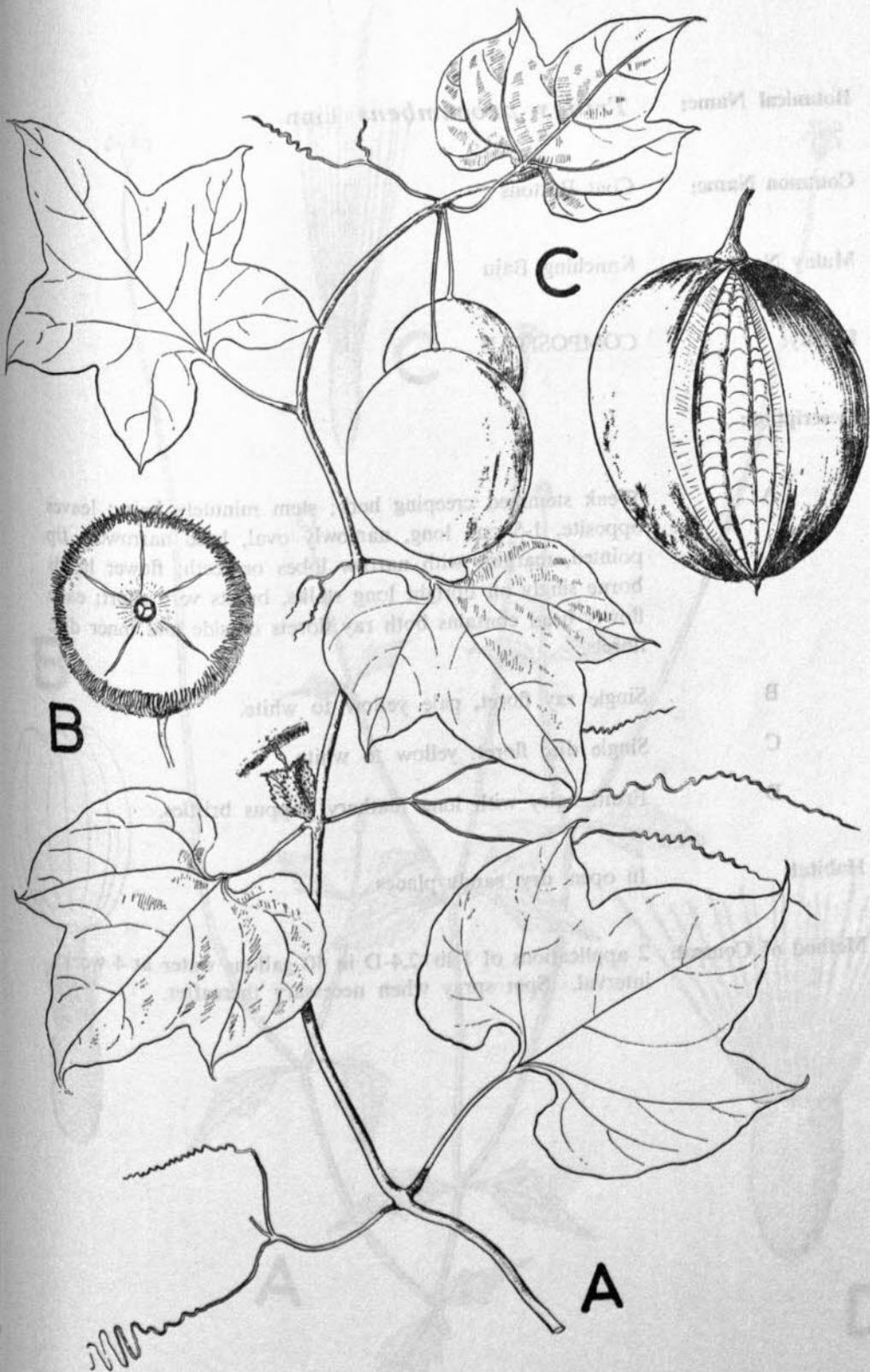
A Stem herbaceous; climbing with coiled tendrils which are divided into 2 or 3; leaves alternate, 7-18 cm. long, triangular with 3-5 pointed lobes, dark green, leaf-base deeply heart-shaped with 5 strong ribs radiating from the top of the leaf-stalk.

B Flowers axillary, in stout spikes, opening at night; female flower rising from a deeply toothed, concave, white leafy bract spotted green, swollen at the base round the ovary, tubular white above; sepals strongly toothed; petals white with fine threads on the margins.

C Fruits rounded, red with a hard outer rind; seeds embedded in greenish black pulp.

Habitat: Common in thickets and clearings.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 40 gallons water at 2-3 weeks interval. Spot spray when necessary.



Botanical Name: *Tridax procumbens* Linn.

Common Name: Coat Buttons

Malay Name: Kanching Baju

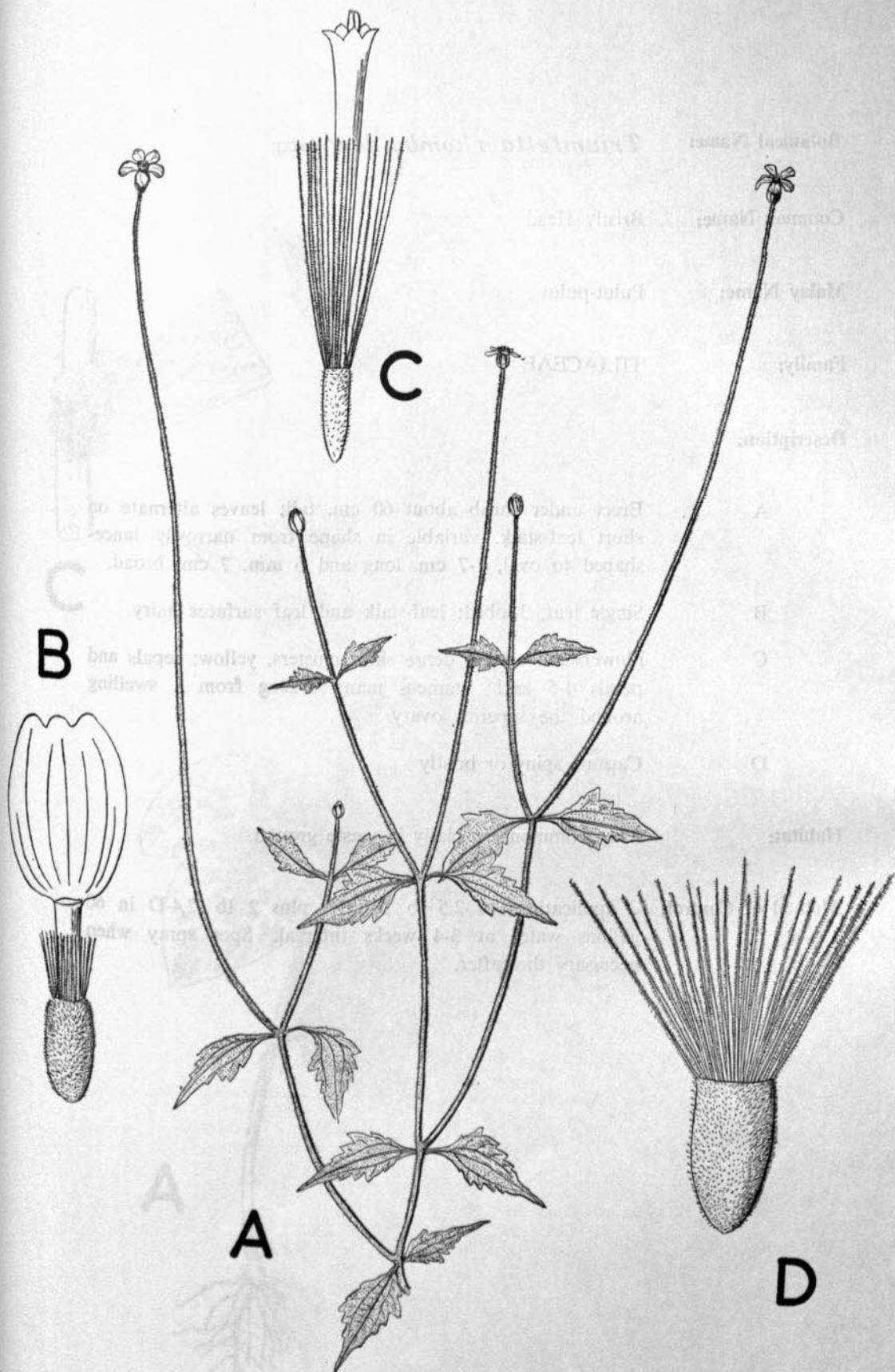
Family: COMPOSITAE

Description:

- A Weak stemmed creeping herb; stem minutely hairy; leaves opposite, 1-5 cm. long, narrowly oval, base narrowed, tip pointed, margins with narrow lobes or teeth; flower heads borne singly on upright long stalks, bracts very short; each flower head contains both ray florets outside and inner disc florets.
- B Single ray floret, pale yellow to white.
- C Single disc floret, yellow to white.
- D Fruit, hairy with long feathery pappus bristles.

Habitat: In open, dry, sandy places.

Method of Control: 2 applications of 1 lb 2,4-D in 40 gallons water at 4 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Triumfetta rhomboidea* Jacq.

Common Name: Bristly Head

Malay Name: Pulut-pulut

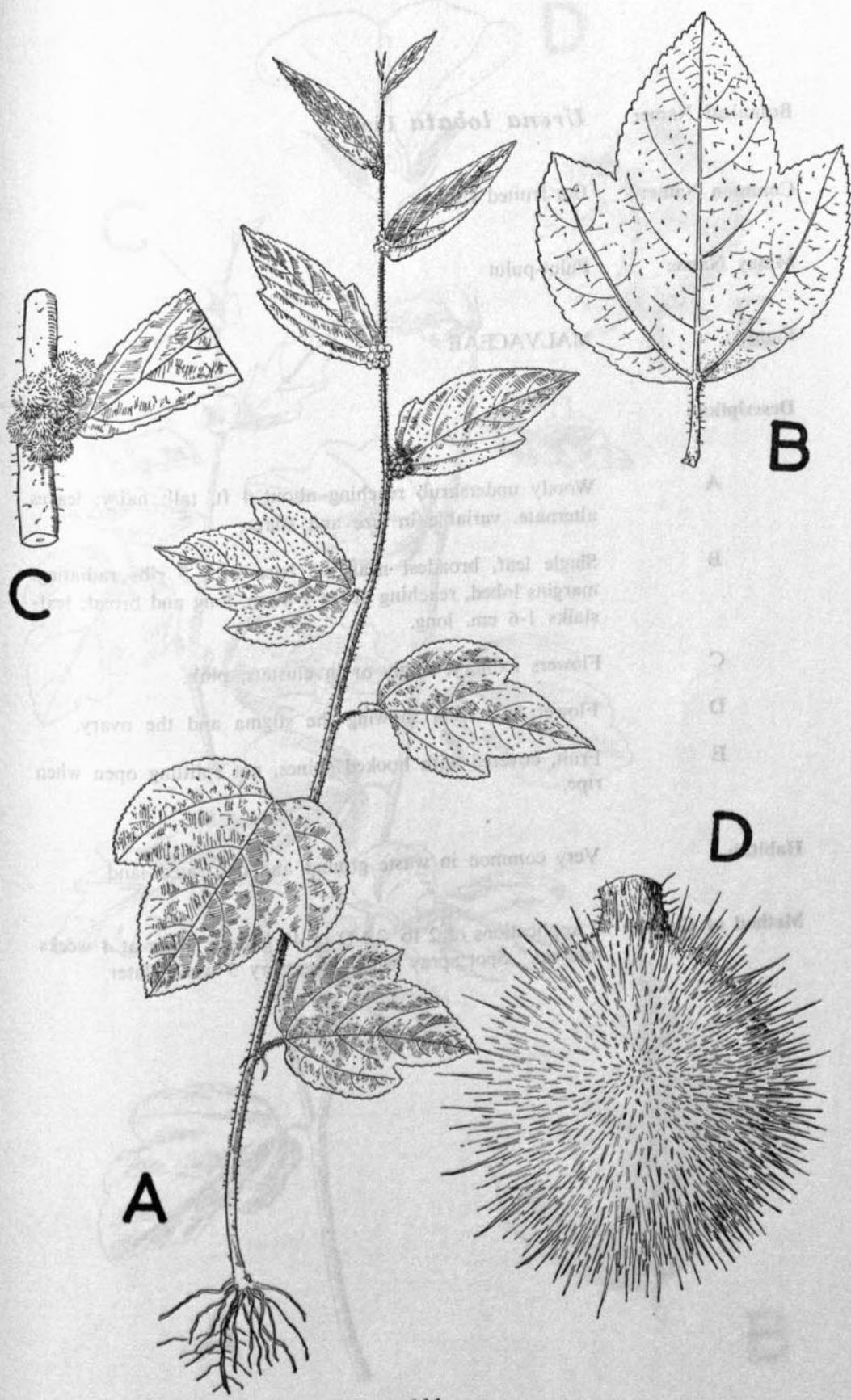
Family: TILIACEAE

Description:

- A Erect under shrub about 60 cm. tall; leaves alternate on short leaf-stalk, variable in shape from narrowly lance-shaped to oval, 1-7 cm. long and 6 mm. 7 cm. broad.
- B Single leaf, 3-lobed; leaf-stalk and leaf surfaces hairy.
- C Flowers axillary, in dense short clusters, yellow; sepals and petals 4-5 each; stamens many arising from a swelling around the superior ovary.
- D Capsule spiny or bristly.

Habitat: Very common especially in waste ground.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 60 gallons water at 3-4 weeks interval. Spot spray when necessary thereafter.



Botanical Name: *Triumfetta rhomboidea* Jacq.

Common Name: Bristly Head

Malay Name: Pulut-pulut

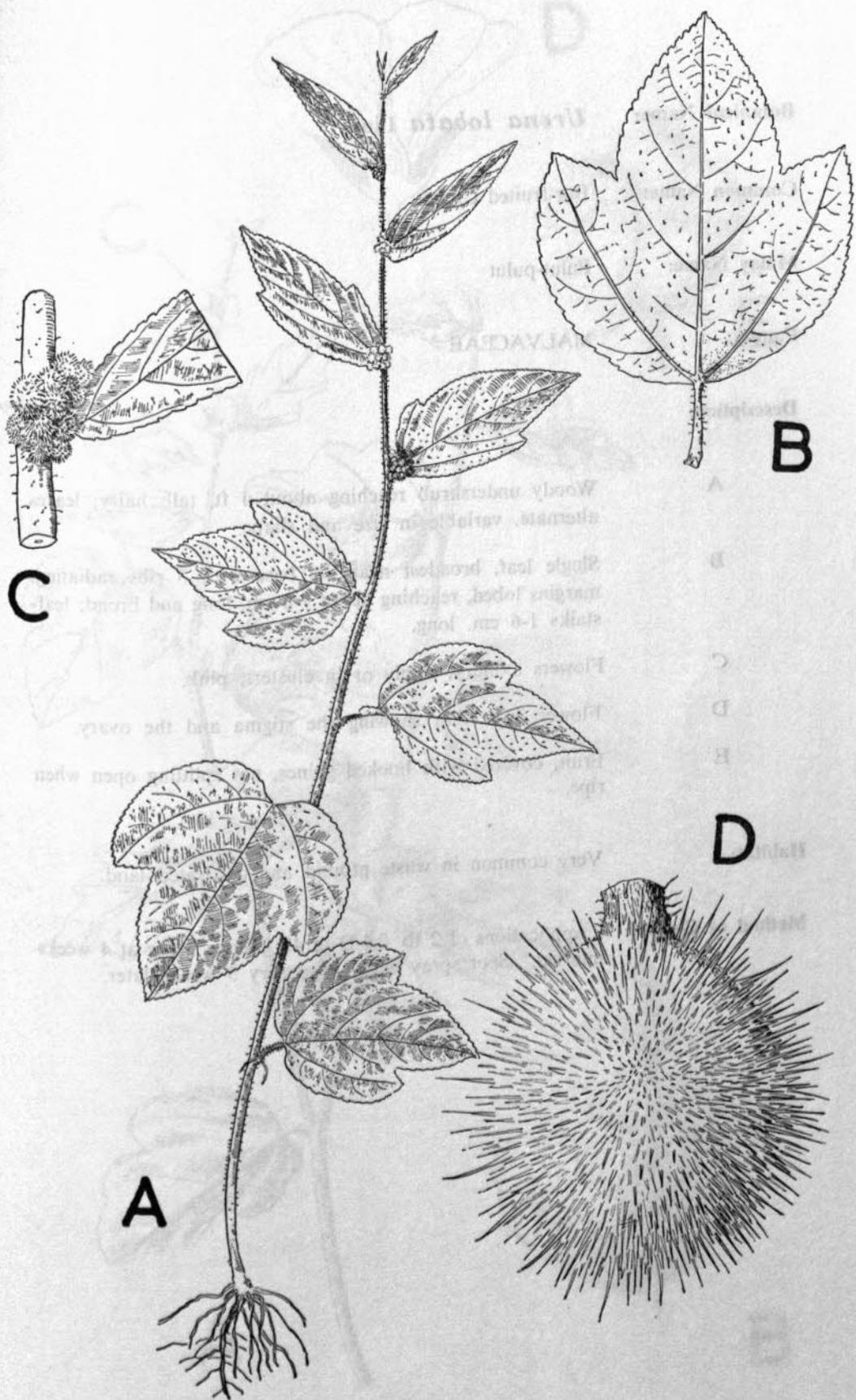
Family: TILIACEAE

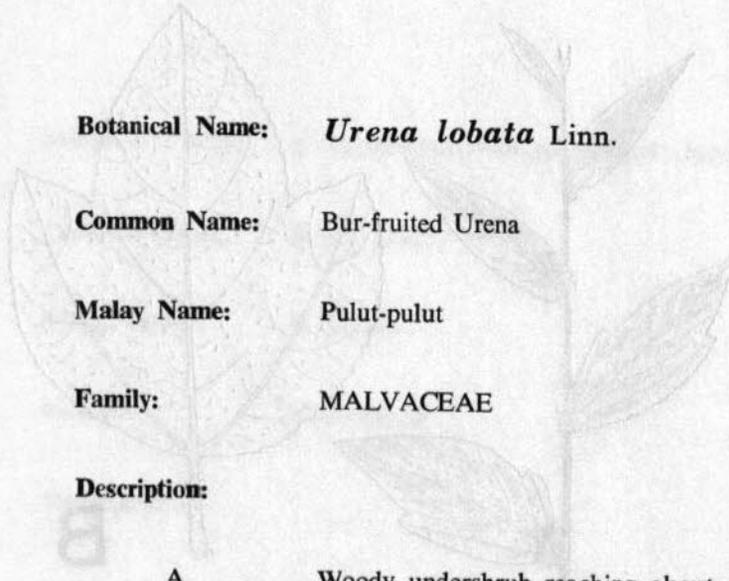
Description:

- A Erect under shrub about 60 cm. tall; leaves alternate on short leaf-stalk, variable in shape from narrowly lance-shaped to oval, 1-7 cm. long and 6 mm. 7 cm. broad.
- B Single leaf, 3-lobed; leaf-stalk and leaf surfaces hairy.
- C Flowers axillary, in dense short clusters, yellow; sepals and petals 4-5 each; stamens many arising from a swelling around the superior ovary.
- D Capsule spiny or bristly.

Habitat: Very common especially in waste ground.

Method of Control: 2 applications of 2.5 lb MSMA plus 2 lb 2,4-D in 60 gallons water at 3-4 weeks interval. Spot spray when necessary thereafter.





Botanical Name: *Urena lobata* Linn.

Common Name: Bur-fruited Urena

Malay Name: Pulut-pulut

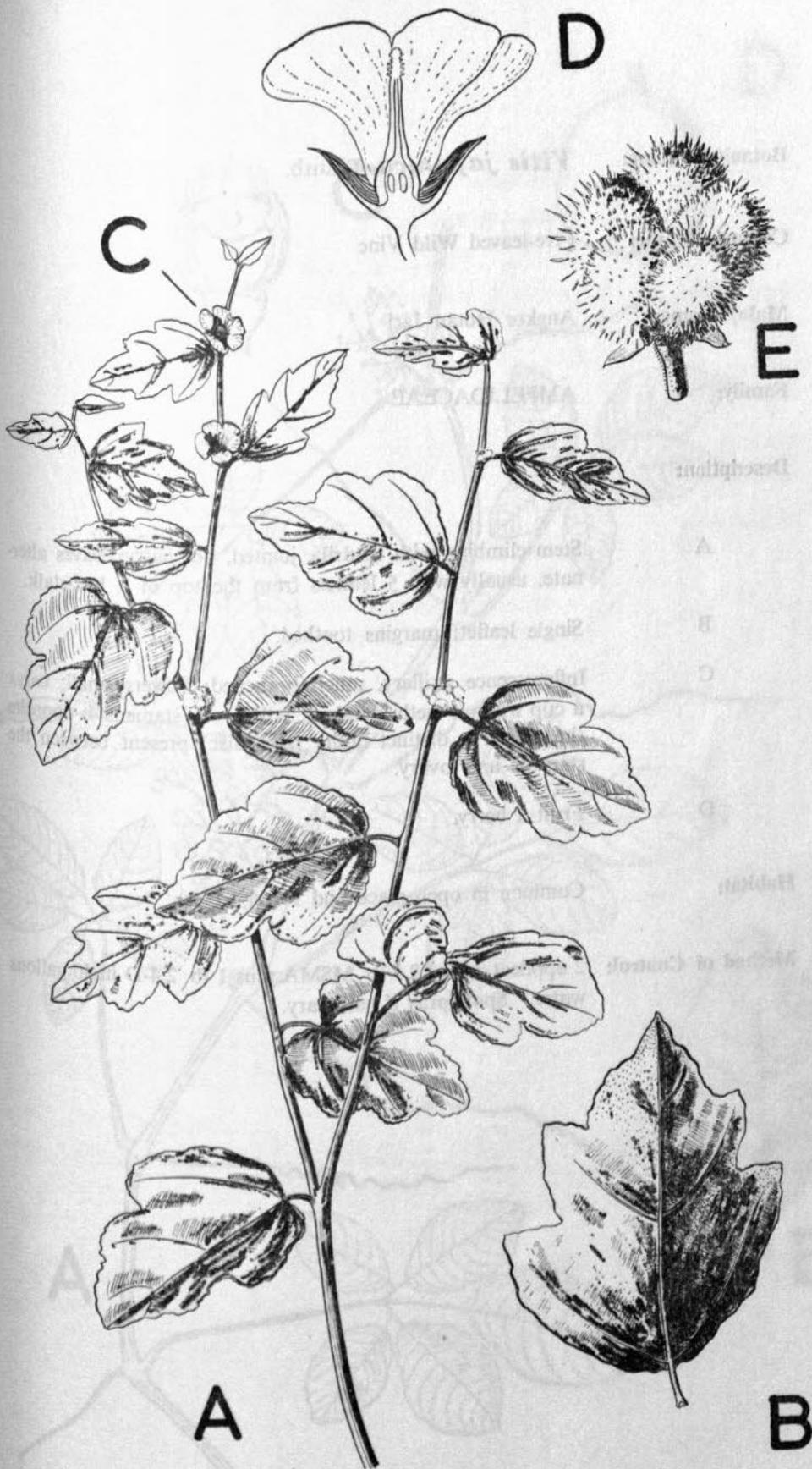
Family: MALVACEAE

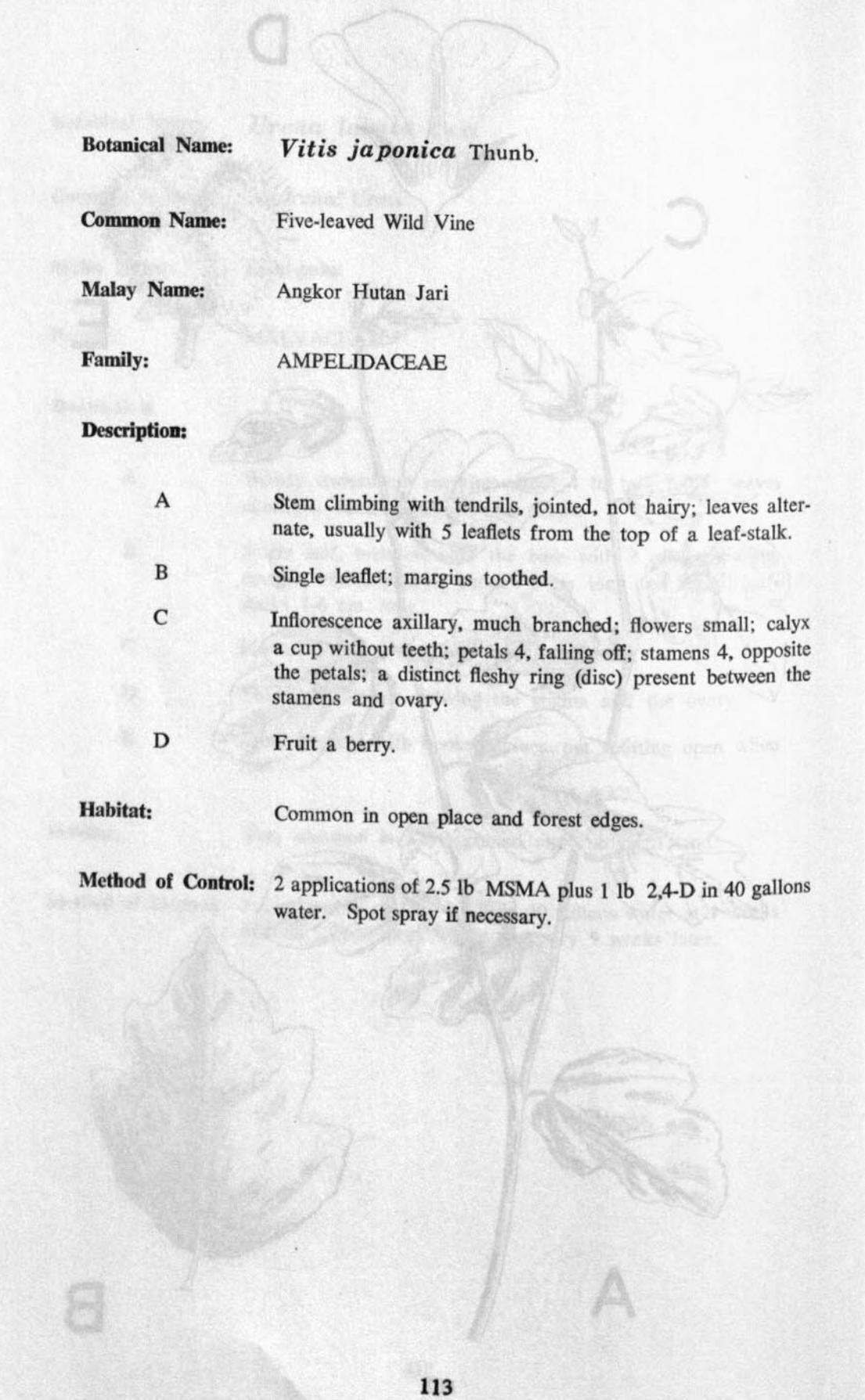
Description:

- A Woody undershrub reaching about 4 ft. tall; hairy; leaves alternate, variable in size and shape.
- B Single leaf, broadest near the base with 3 ribs radiating, margins lobed, reaching about 7-8 cm. long and broad; leaf-stalks 1-6 cm. long.
- C Flowers axillary, singly or in clusters, pink.
- D Flower in section showing the stigma and the ovary.
- E Fruit, covered with hooked spines, not splitting open when ripe.

Habitat: Very common in waste ground and cultivated land.

Method of Control: 2 applications of 2 lb 2,4-D in 40 gallons water at 4 weeks interval. Spot spray where necessary 5 weeks later.





Botanical Name: *Vitis japonica* Thunb.

Common Name: Five-leaved Wild Vine

Malay Name: Angkor Hutan Jari

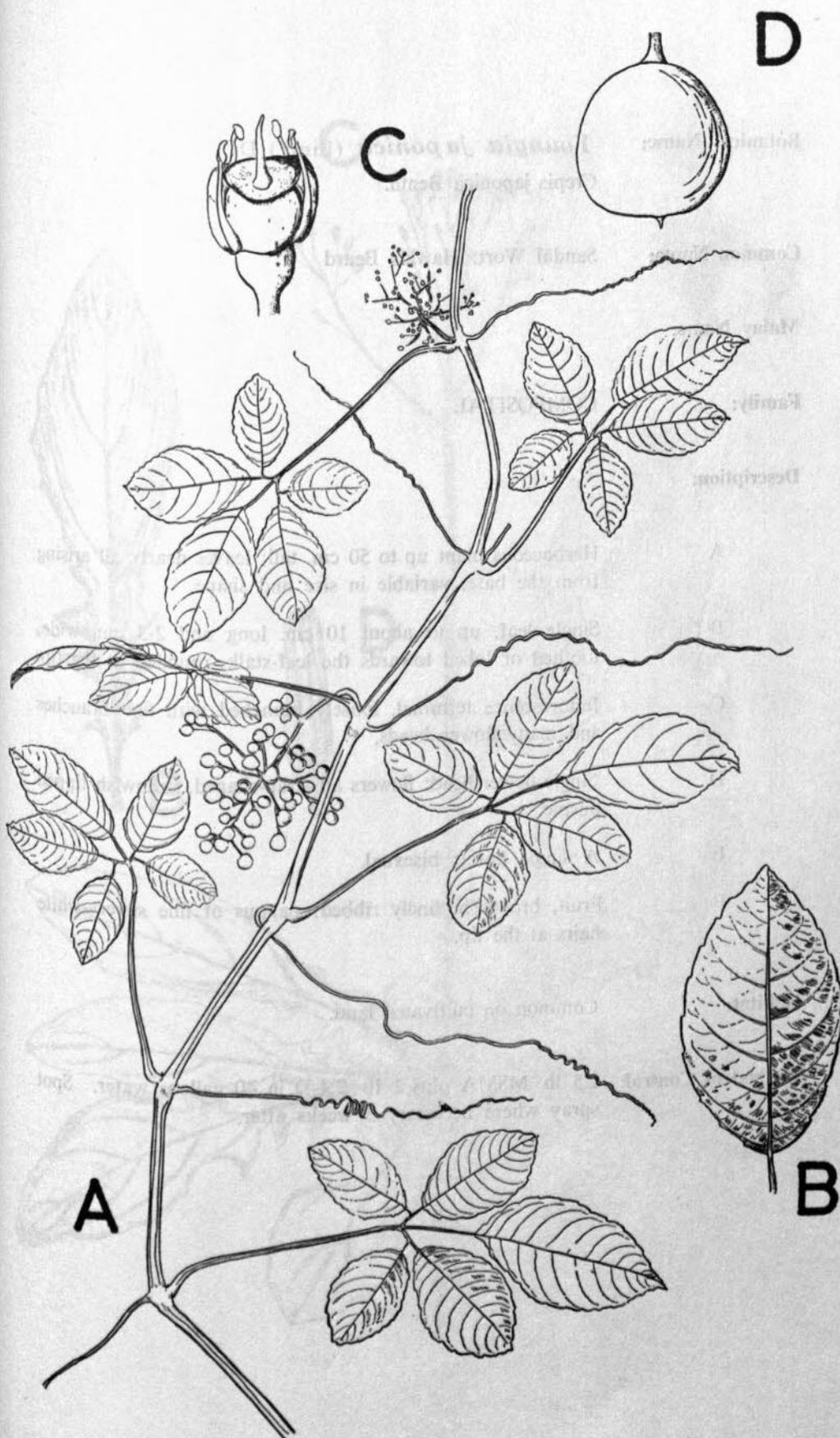
Family: AMPELIDACEAE

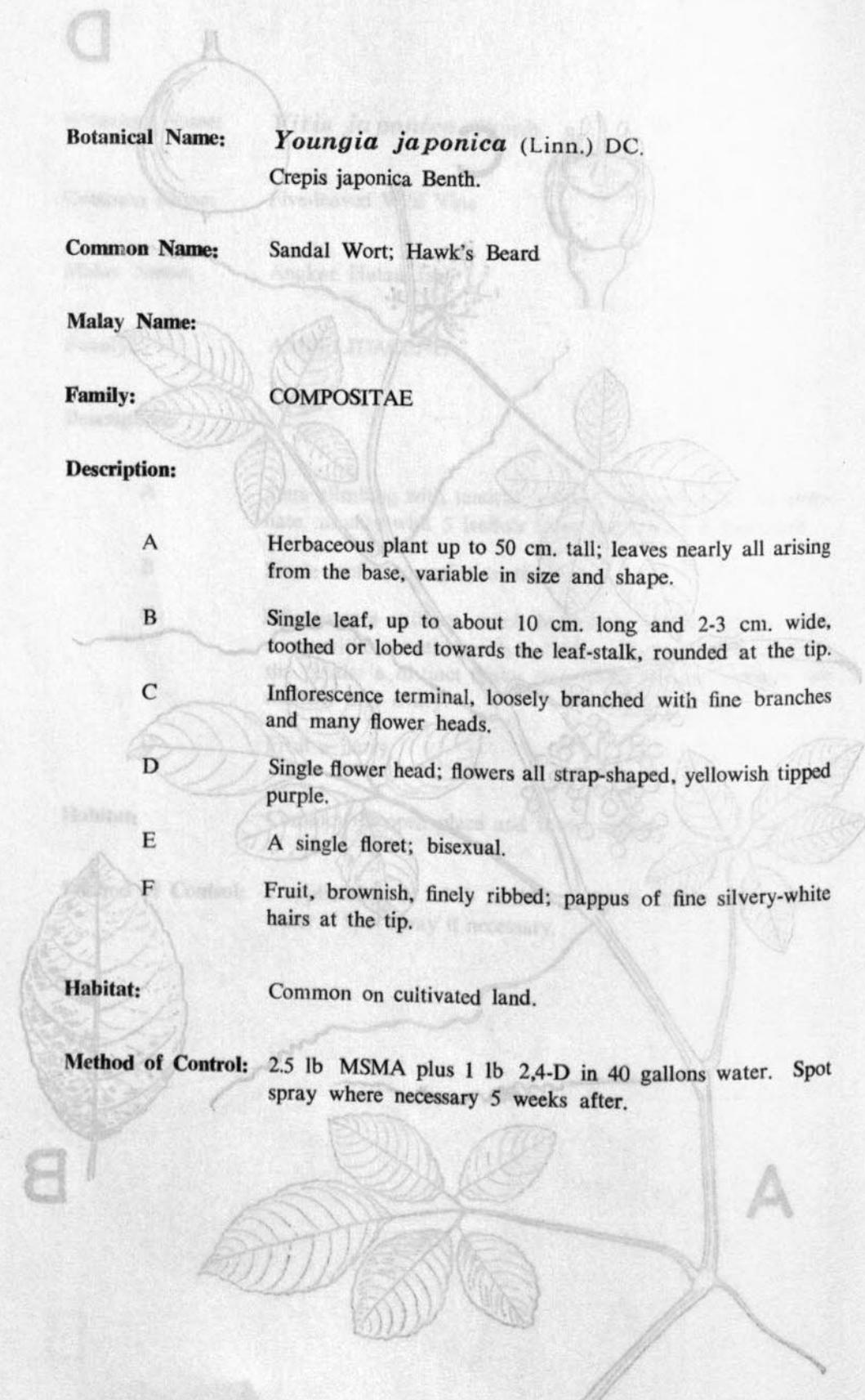
Description:

- A Stem climbing with tendrils, jointed, not hairy; leaves alternate, usually with 5 leaflets from the top of a leaf-stalk.
- B Single leaflet; margins toothed.
- C Inflorescence axillary, much branched; flowers small; calyx a cup without teeth; petals 4, falling off; stamens 4, opposite the petals; a distinct fleshy ring (disc) present between the stamens and ovary.
- D Fruit a berry.

Habitat: Common in open place and forest edges.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray if necessary.





Botanical Name: *Youngia japonica* (Linn.) DC.
Crepis japonica Benth.

Common Name: Sandal Wort; Hawk's Beard

Malay Name:

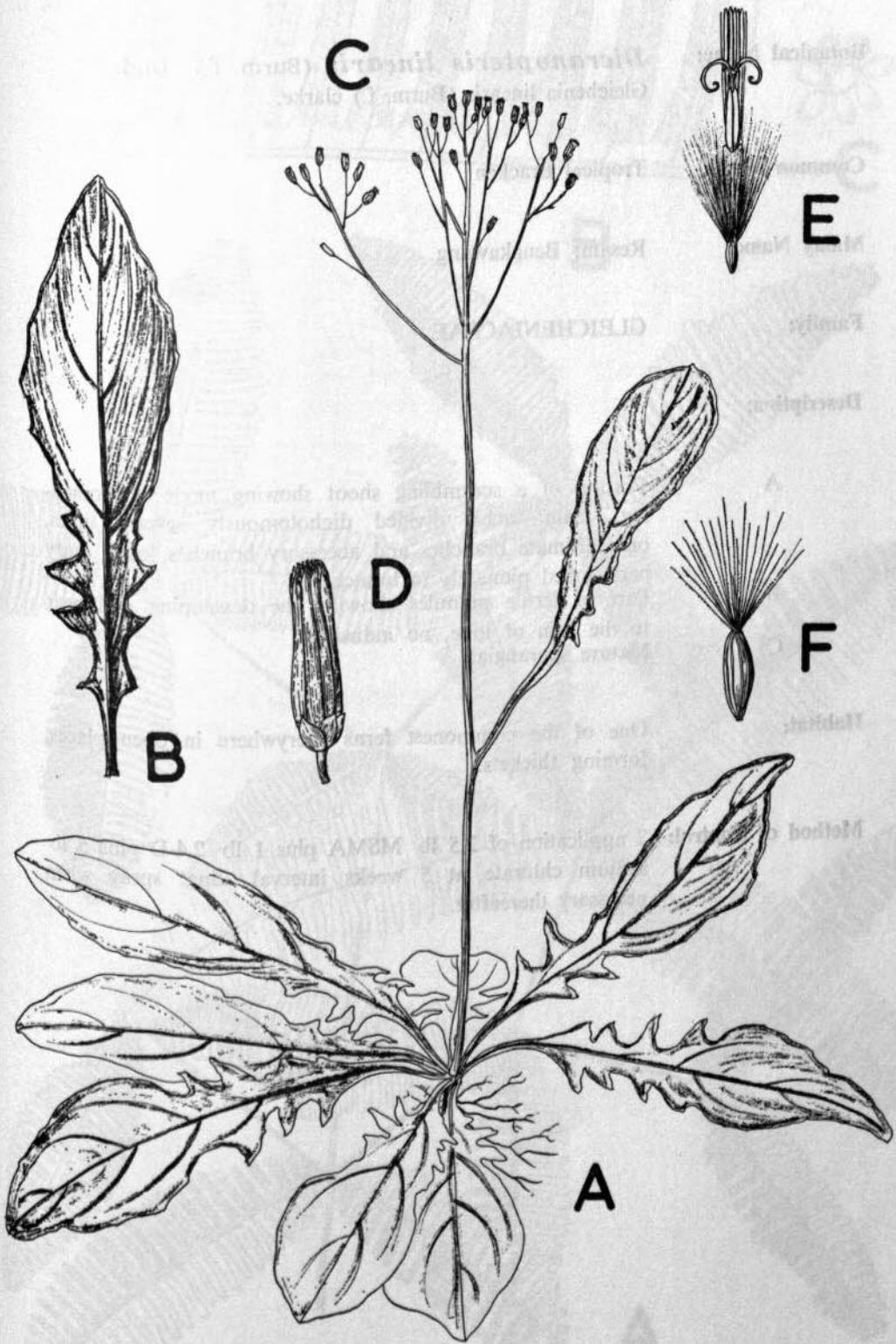
Family: COMPOSITAE

Description:

- A Herbaceous plant up to 50 cm. tall; leaves nearly all arising from the base, variable in size and shape.
- B Single leaf, up to about 10 cm. long and 2-3 cm. wide, toothed or lobed towards the leaf-stalk, rounded at the tip.
- C Inflorescence terminal, loosely branched with fine branches and many flower heads.
- D Single flower head; flowers all strap-shaped, yellowish tipped purple.
- E A single floret; bisexual.
- F Fruit, brownish, finely ribbed; pappus of fine silvery-white hairs at the tip.

Habitat: Common on cultivated land.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 40 gallons water. Spot spray where necessary 5 weeks after.



Botanical Name: *Dicranopteris linearis* (Burm. f.) Und.
Gleichenia linearis (Burm. f.) clarke.

Common Name: Tropical Bracken

Malay Name: Resam; Bengkawang

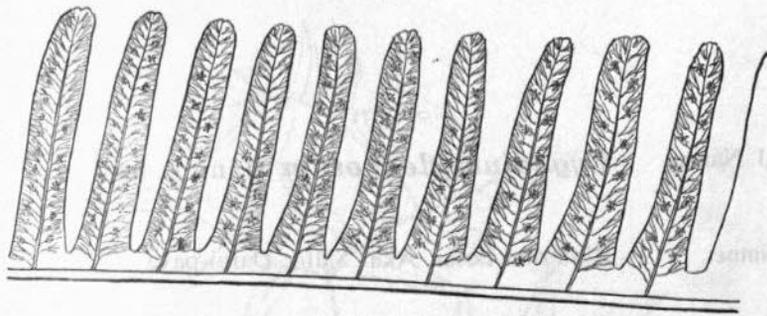
Family: GLEICHENIACEAE

Description:

- A Portion of a scrambling shoot showing mode of branching; main rachis divided dichotomously several times, only ultimate branches and accessory branches leafy; leafy parts lobed pinnately to branch.
- B Part of fertile pinnules showing the developing sori near to the vein of lobe, no indusium.
- C Mature sporangia.

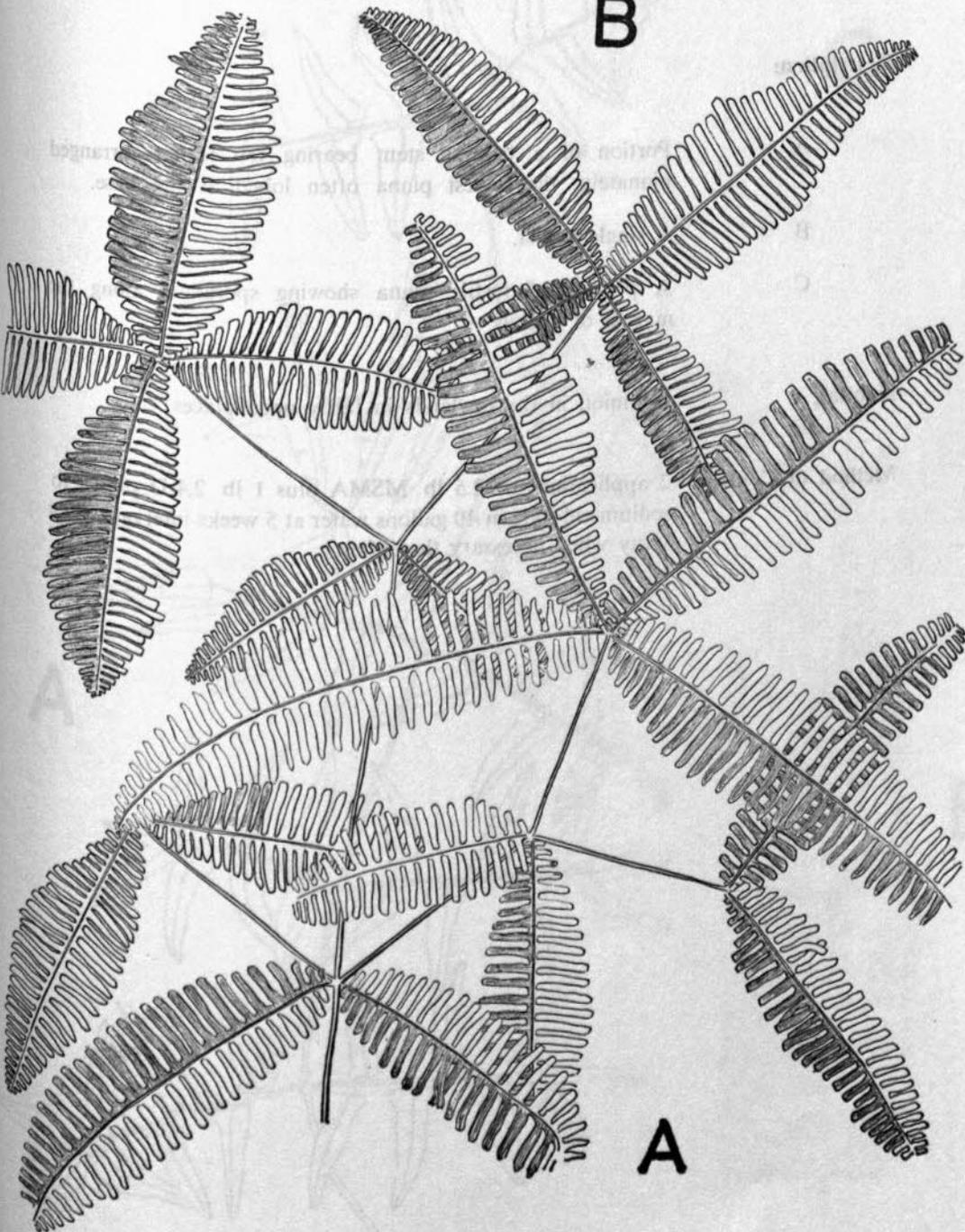
Habitat: One of the commonest ferns everywhere in open places, forming thickets.

Method of Control: 2 application of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate at 5 weeks interval. Spot spray when necessary thereafter.



C

B



A

Botanical Name: *Lygodium flexuosum* (Linn.) Sw.

Malay Name: Ribu-ribu Besar, Akar Sidin; Darai-paya

Family: SCHIZAEACEAE

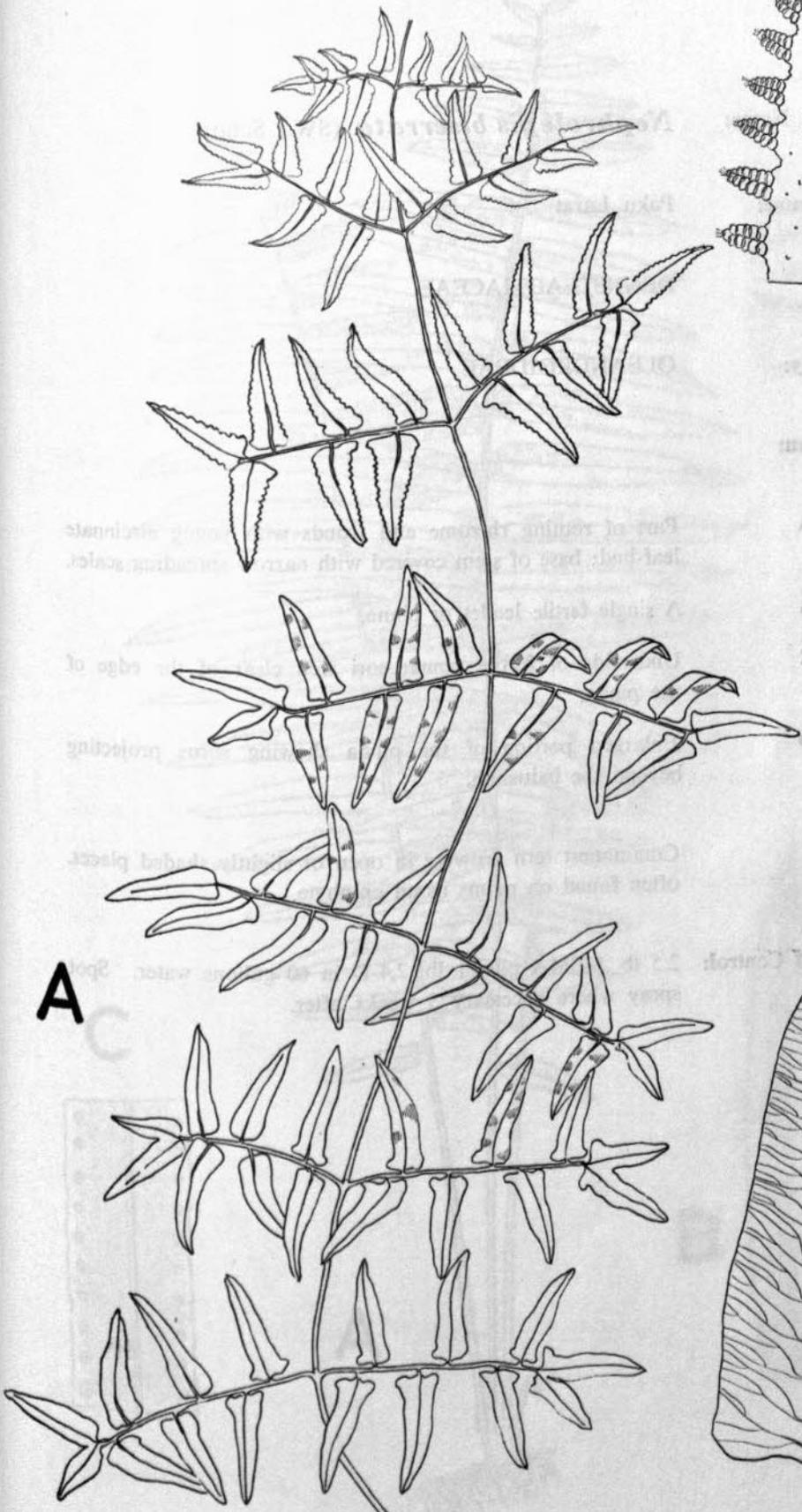
Description:

- A Portion of a twining stem bearing 6-9 leaflets arranged pinnately; the lowest pinna often lobed at the base.
- B A single leaflet.
- C A portion of fertile pinna showing sporangia along the margin of leaflets.

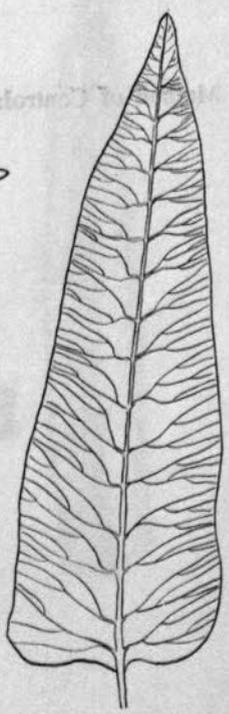
Habitat: Common in the lowlands in fairly open places.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.

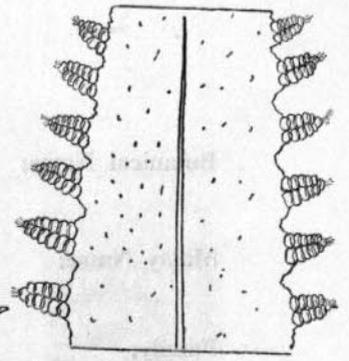
A



A



B



C

Botanical Name: *Nephrolepis biserrata* (SW.) Schott.

Malay Name: Paku Larat

Family: DENNSTEADTIACEAE

Sub-family: OLEANDROIDEAE

Description:

- A Part of rooting rhizome and fronds with young circinnate leaf-bud; base of stem covered with narrow spreading scales.
- B A single fertile leaflet or pinna.
- C Underside of fertile pinna; sori well clear of the edge of the pinna.
- D Enlarged portion of the pinna showing sorus projecting beyond the indusium.

Habitat: Commonest fern growing in open or slightly shaded places, often found on palms as an epiphyte.

Method of Control: 2.5 lb MSMA plus 1 lb 2,4-D in 60 gallons water. Spot spray where necessary 5 weeks after.

E

1931

1931

plus 2 lb

1931

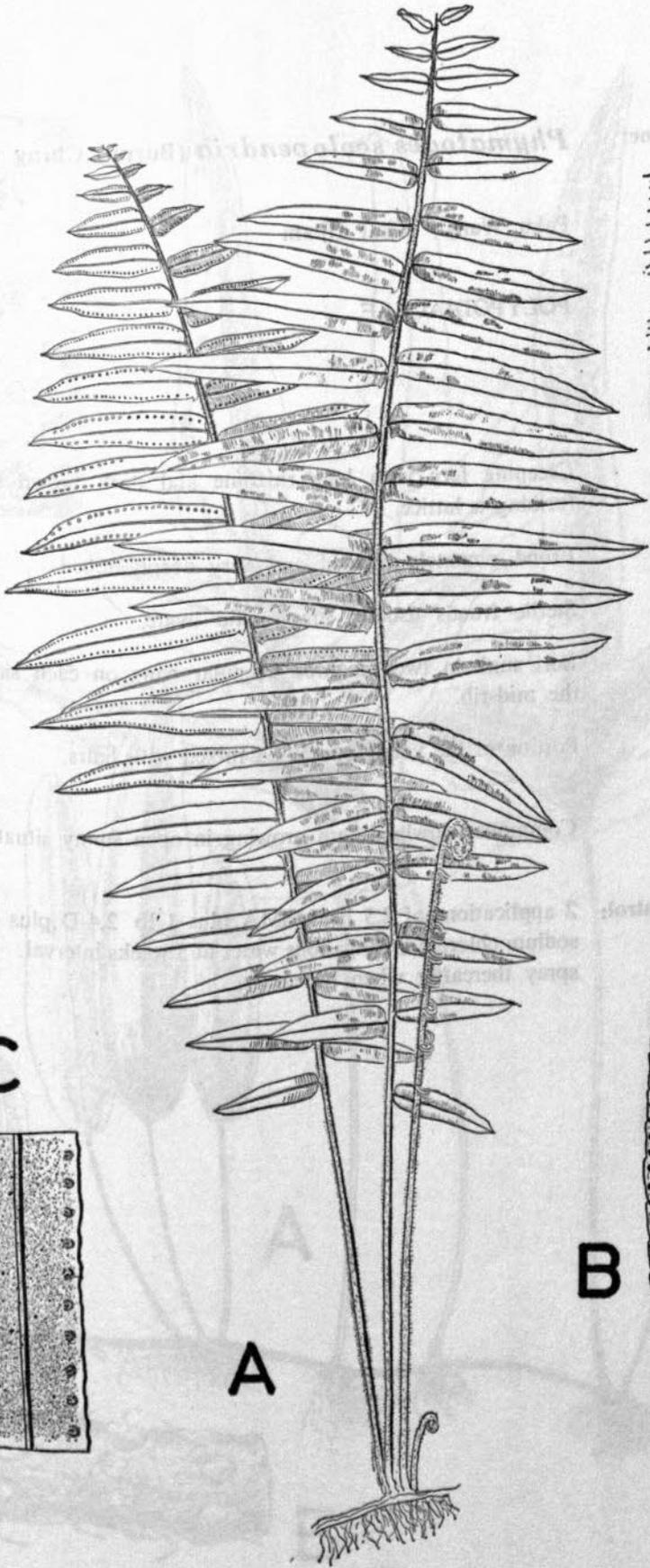
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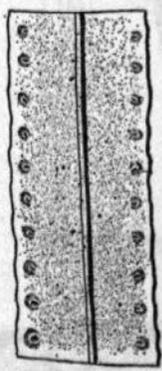
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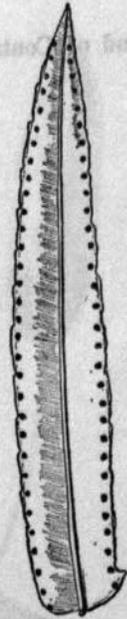
1931



D



C



B

A

Botanical Name: *Phymatodes scolopendria* (Burm.) Ching 1933.

Malay Name: Paku Wangi; Sakat Hitam

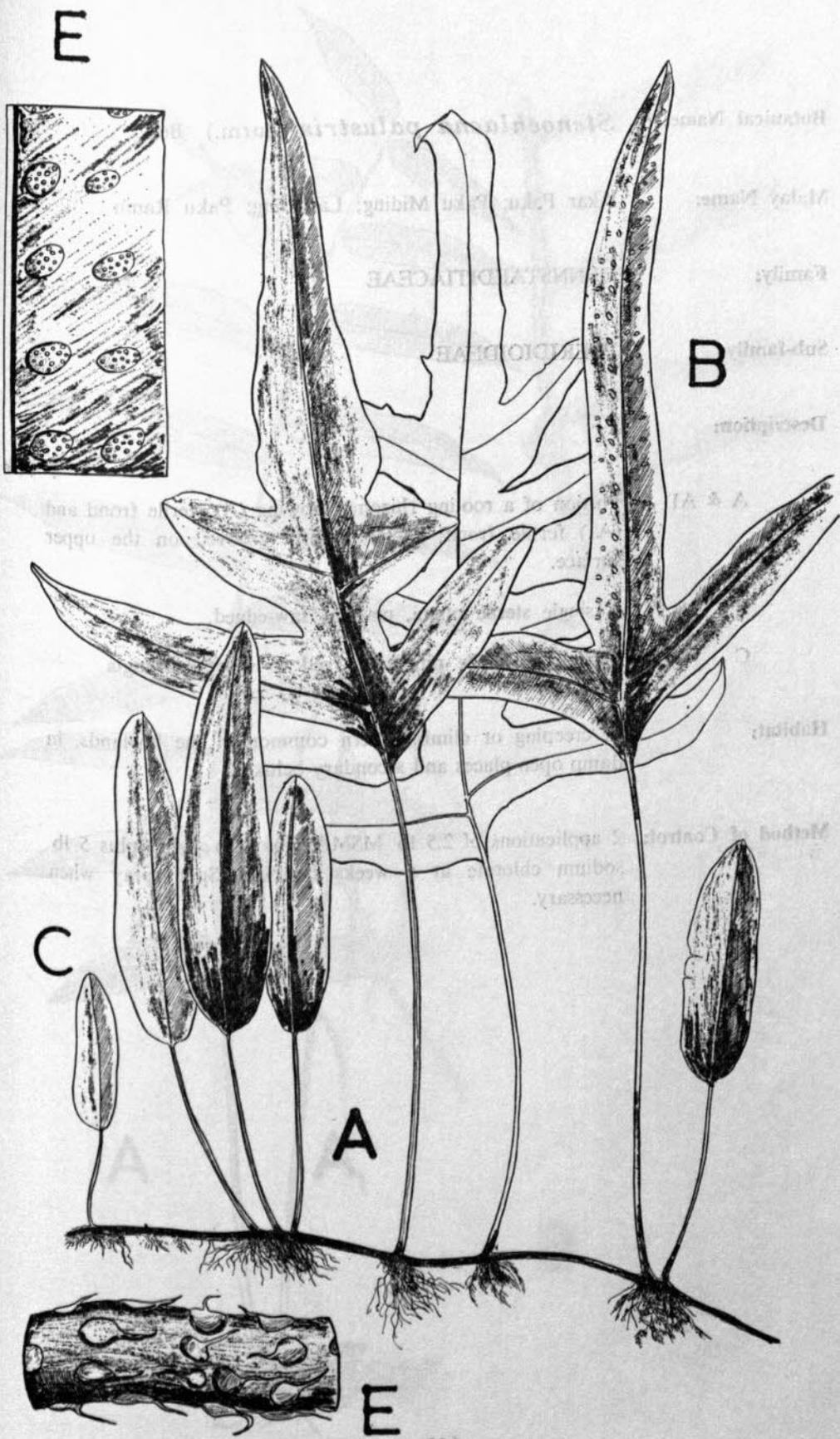
Family: POLYPODIACEAE

Description:

- A Creeping fern with long rhizome and dark brown scales forming a lattice.
- B Frond pinnately divided and very deeply lobed.
- C Sterile fronds usually simple and ovate.
- D Sori sunk in two or three irregular rows on each side of the mid-rib.
- E Portion of the young sporangia mixed with hairs.

Habitat: Commonest lowland fern growing in open sunny situations.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 60 gallons water at 5 weeks interval. Spot spray thereafter when necessary.



E

Botanical Name: *Stenochlaena palustris* (Burm.) Bedd.

Malay Name: Akar Paku; Paku Miding; Lamiding; Paku Ramu

Family: DENNSTAEDITACEAE

Sub-family: PTERIDIOIDEAE

Description:

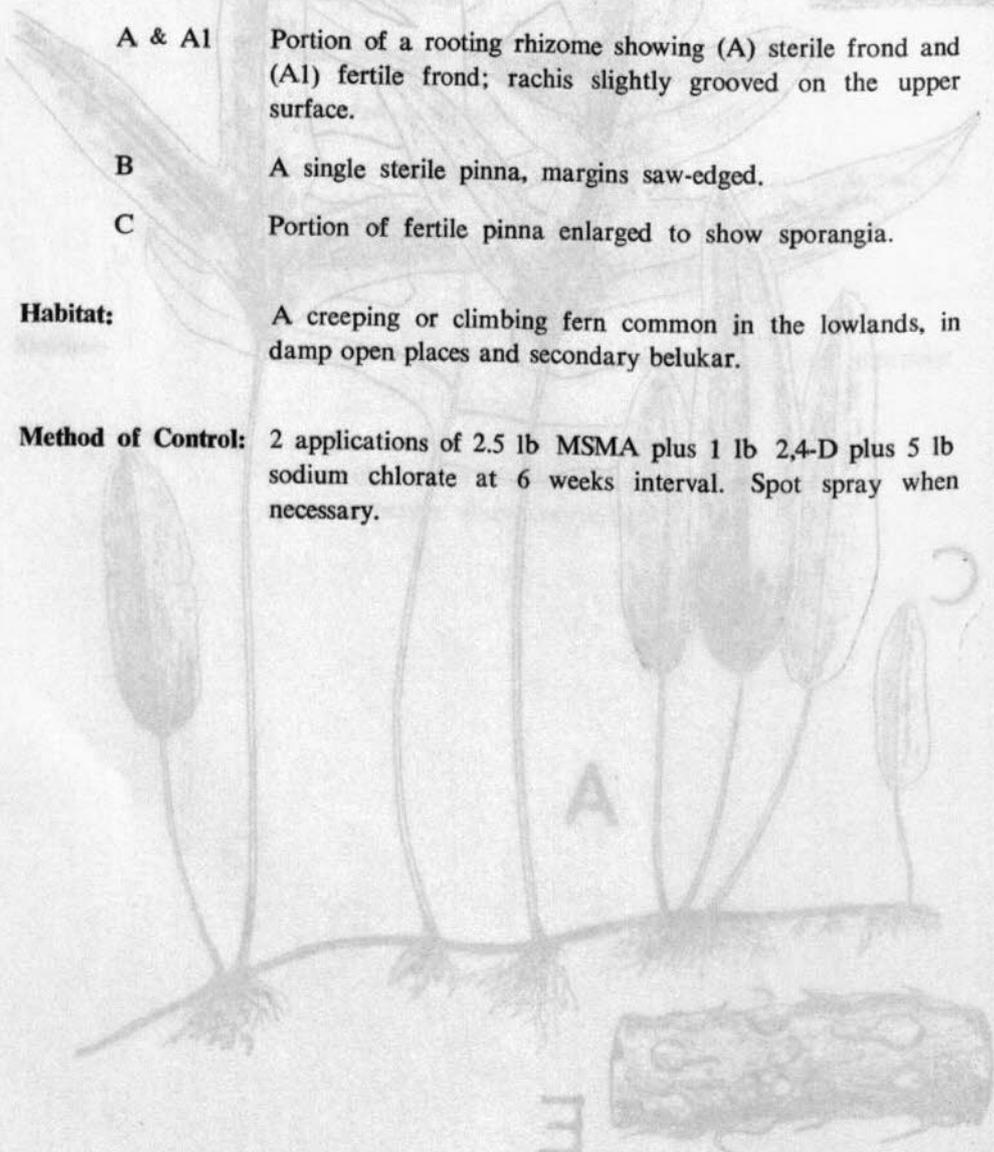
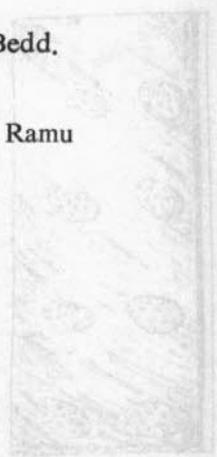
A & A1 Portion of a rooting rhizome showing (A) sterile frond and (A1) fertile frond; rachis slightly grooved on the upper surface.

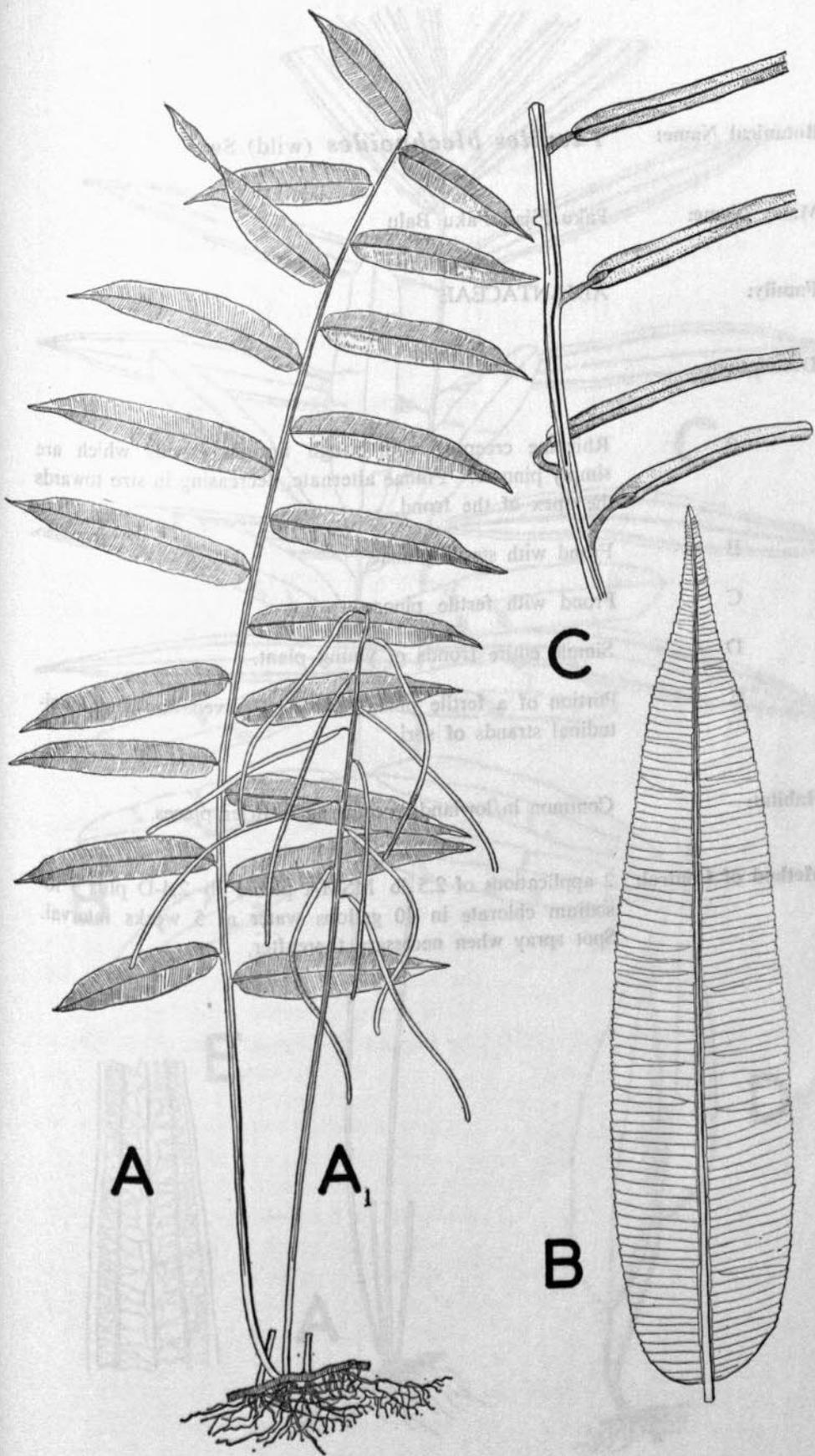
B A single sterile pinna, margins saw-edged.

C Portion of fertile pinna enlarged to show sporangia.

Habitat: A creeping or climbing fern common in the lowlands, in damp open places and secondary belukar.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate at 6 weeks interval. Spot spray when necessary.





Botanical Name: *Taenites blechnoides* (wild) Sw.

Malay Name: Paku Pijai; Paku Balu

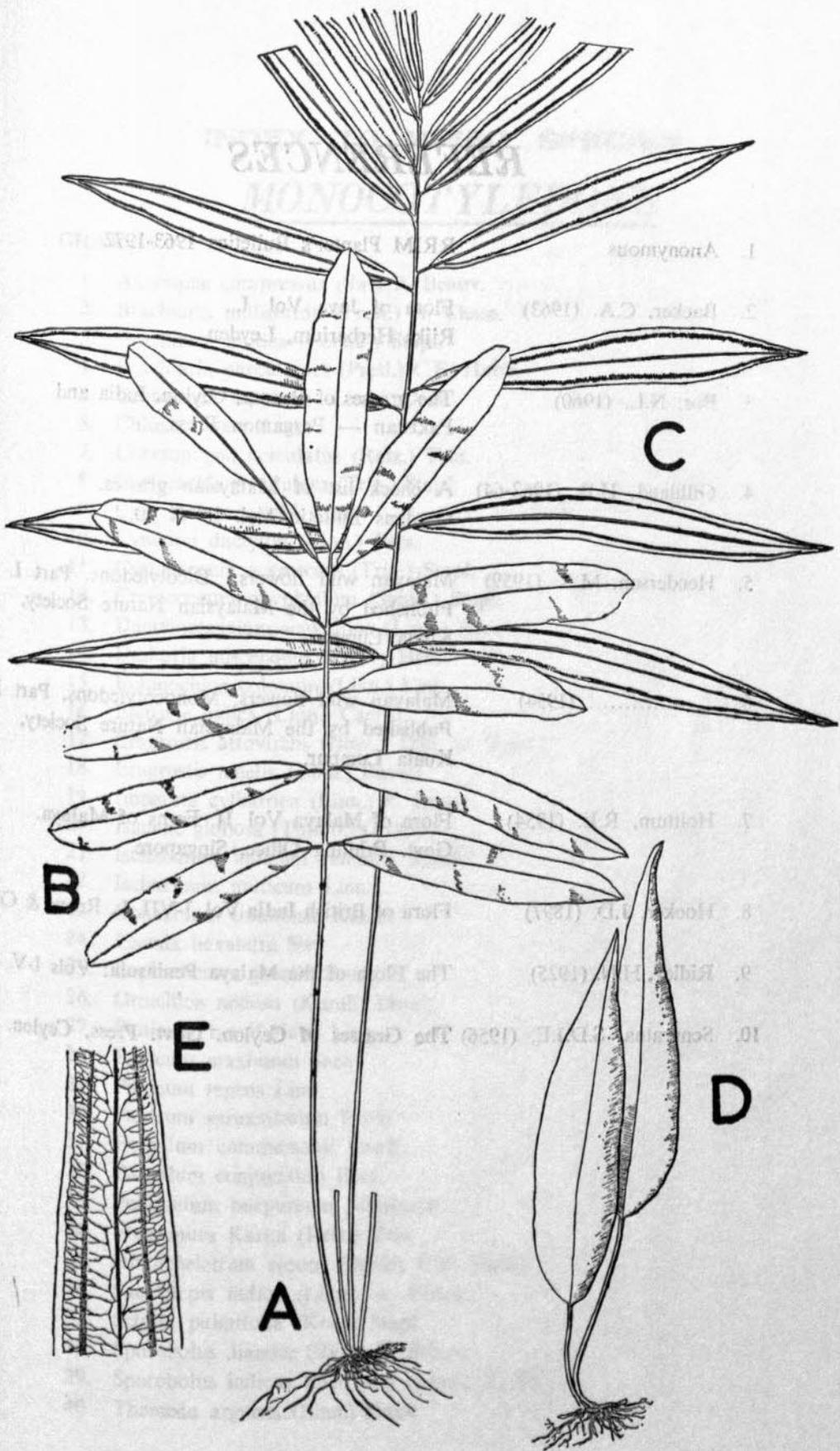
Family: ADIANTACEAE

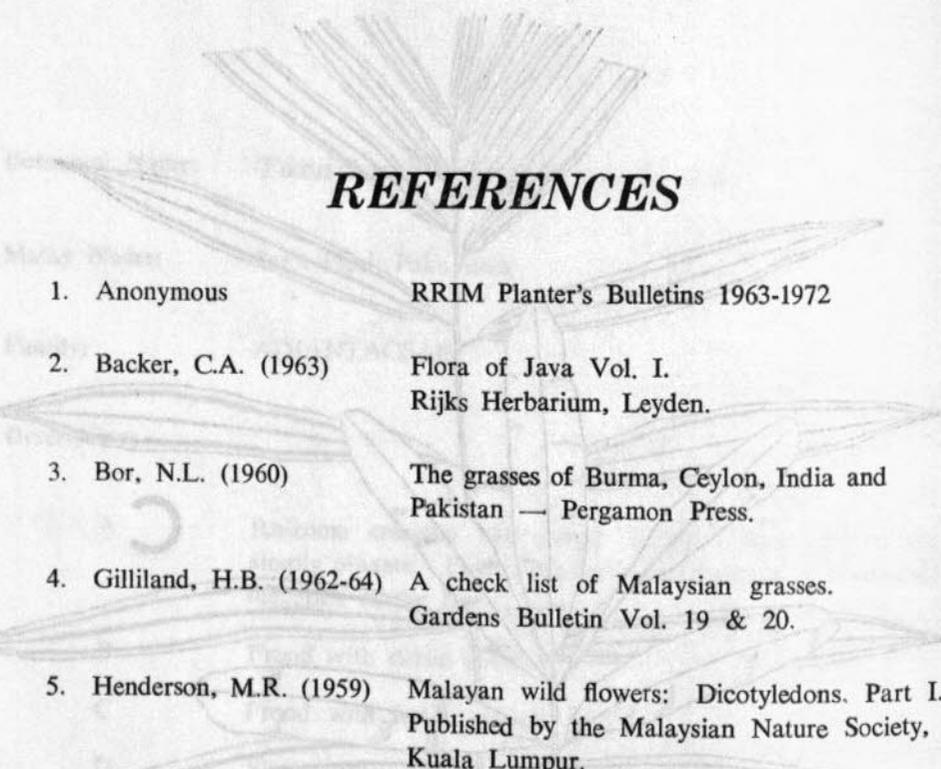
Description:

- A Rhizome creeping with rough upright fronds which are simply pinnate. Pinnae alternate, decreasing in size towards the apex of the frond.
- B Frond with sterile pinnae.
- C Frond with fertile pinnae.
- D Simple entire fronds of young plant.
- E Portion of a fertile pinna showing the venation and longitudinal strands of sori.

Habitat: Common in lowlands, occurring in drier places.

Method of Control: 2 applications of 2.5 lb MSMA plus 1 lb 2,4-D plus 5 lb sodium chlorate in 40 gallons water at 5 weeks interval. Spot spray when necessary thereafter.





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3. *Brachiaria mutica* (Forssk.) Stapf.
4. *Brachiaria paspaloides* (Presl.) C.E. Hubb.
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KEY TO THE SPECIES OF GRASSES AND SEDGES

When an unfamiliar weed of a grass or sedge is encountered, this weed manual may help to determine its identity. One way is to thumb through the various illustrations in an attempt to match the specimen to its proper picture. This practice may be uncertain and time consuming. The use of the plant key allows much easier and quicker determination of the species.

The key is constructed on the basis of a pair of contrasting morphological characters. The procedure is to follow the choice of one of the contrasting characters that applies most to the specimen in question disregarding the other one. The numerical on the left of the key defines the pair of contrasting characters. Those on the right indicate the 'go to' keys to which the specimen be referred to depending on the situation to decide which of the pair of characters under consideration is applicable to the specimen. For example, in the case of grasses, if the inflorescence is 'unbranched', refer to key number 2, and if 'branched' refer to key number 19. Similarly, repeat the selection until the identity of the species is finally established. The number in brackets after the species refers to the plate number of the illustration.

The authors would be thankful to learn of any difficulties the user may encounter with the key with a view to perfecting its usage.

KEY TO THE SPECIES OF GRASSES

- Stem round, hollow; leaf-sheath with free (open) margin;
 ligule and lodicule present; fruit a caryopsis GRAMINEAE
1. Inflorescence unbranched 2
 - Inflorescence branched 19
 2. Inflorescence spikes arising from end of stem 3
 - Inflorescence spikes arising from leaf axils 17
 3. Inflorescence of a single unbranched long or short spike 4
 - Inflorescence of 2 or more spikes 7
 4. Spike covered with soft silvery white fluffy hairs.
 - Grass with extensive scaly underground rhizomes,
 leaves tightly sheathed at base, mid-rib white and
 almost the width of the blade at base **Imperata cylindrica** (19)*
 - Spike without fluffy hairs 5
 5. Perennial grass 300 cm. or more high, spike 15-30 cm. long, yellow;
 - spikelets in groups 1-3 and surrounded
 by slender bristles **Pennisetum purpureum** (33)
 - Annual grass up to 30 cm. high, spikelets without bristles 6
 6. Stem rhizomatous and creeping.
 - Spikelets elliptical and flattened, symmetrical,
 lower empty glume absent, ligule narrow ciliate
 membrane **Zoysia matrella** (43)
 - Stem tufted.
 - Spikelets ovoid, curved, asymmetrical, lower empty glume present,
 ligule a ridge of short hairs **Sacciolepis indica** (36)
 7. Inflorescence of only 2 spikes 8
 - Inflorescence of more than 2 spikes 11
 8. Spikes closely pressed together and appear as one spike;
 - Creeping perennial grass, junction of blade with
 sheath distinctly narrowed to almost a 'strap-like'
 stalk, spikelets unawned, stigmas white ... **Ischaemum muticum** (22)
 - Spikes divergent 9
 9. Spikelets fringed with long silky hairs, without awns, almost
 round and planoconvex, overlapping on each side of a flattened

*Numbers within brackets refer to the plate numbers.

- rachis, grass creeping, perennial, nodes and leaf-sheath often purple **Paspalum conjugatum** (32)
- Spikelets not fringed with silky hairs, awns present 10
10. Leaves rounded at base, keel of the upper empty glume narrowly winged on the margin near the tip ... **Ischaemum indicum** (21)
- Leaves narrowed to the base, glumes without wings but the lower empty glume notched at the tip **Ischaemum timorense** (23)
11. Spikelets with awns 12
- Spikelets without awns 13
12. Awns short and stiff, axis of the spike prolonged beyond the last spikelet into a short point, spikes 3-5, 1.5-3 cm. long, comb-like **Dactyloctenium aegyptium** (13)
- Awns long, hair or bristle-like, axis of spikes ending in a spikelet and not prolonged, spikes 7-8 digitate, 2-10 cm. long, usually flushed purple **Chloris inflata** (6)
13. Inflorescence usually more than one rising from the top-most leaf-axil.
- Creeping grass with tufted, crinkled leaves, spikelets alternate on either side of the flattened rachis, not overlapping, lower empty glume absent **Axonopus compressus** (1)
- Inflorescence usually only one 14
14. Spikelets not obviously in 2 rows, crowded, each spikelet with several bisexual florets.
- Tufted grass 60-75 cm. tall, leaf-blade often folded, spikes 3 or more at the top of stem, sometimes with one off-set below **Eleusine indica** (16)
- Spikelets in 2 evident rows, not crowded, each spikelet with only one bisexual floret 15
15. Stem not creeping and not rooting from nodes.
- Tufted perennial with swollen smooth nodes and hairless leaves, spikes 2-4 bearing a tuft of long white hairs at base, spikelets not hairy **Paspalum commersonii** (31)
- Stem creeping and rooting profusely from nodes 16

16. Spikelets not stalked.
 Spikes 2-6, 3-6 cm. long, spikelets overlapping closely, the basal empty glumes ciliated and remain on the spike after the spikelets fall off, leaves sometimes sparingly hairy, margins toothed, ligule a ring of short fine hairs **Cynodon dactylon** (10)
- Spikelets stalked.
 Spikes several in a terminal whorl, sometimes with false whorl(s) below, 7-15 cm. long, leaves hairy, margins crinkled, ligule membranous and clasping the stem **Digitaria adscendens** (14)
17. Base of female spikelet enclosed in a smooth hard shining bead-like, pear-shaped shell; male spikelet protruding from the shell **Coix lachryma-jobi** (9)
- Not as above; spikes divided into short joints and spikelets fitting into hollows or sunken in cavities 18
18. Stem 200-300 cm. high with leaves 100-150 cm. long and 5-10 cm. wide, ligule a membranous ridge, spikelets unisexual, both sexes in the same plant, female spikelet sunken in cavities **Tripsacum laxum** (42)
- Stem 100-200 cm. high, leaves up to 60 cm. long and 2-3 cm. wide, ligule at tuft of fine hairs, the unstalked spikelet fits into the hollow of the joint, lower empty glume with dark coloured wings and a row of warts on margin at the base **Coelorachis glandulosa** (8)
19. Spikelets with one or two bristles at the base.
 The bristles remain on the axis after the spikelets fall off, leaves pleated along the veins **Setaria palmifolia** (37)
- Spikelets without such bristles 20
20. Spikelets covered with fine silky hairs 21
- Spikelets not covered with such hairs 22
21. Tall and reed-like; 300-400 cm. high forming thickets, ligule wanting, inflorescence 30-60 cm. long spikelets spaced apart along a jointed axis, 3-7 flowered, the lower most male and others bisexual,

- awns absent **Phragmites karka** (34)
- Not tall and reed-like; 30-90 cm. high, ligule a minutely hairy rim, inflorescence 10-20 cm. long, beautifully silky reddish, purplish or white, flowering glumes with awns **Rhyncheletrum repens** (35)
- 22. Some or all spikelets with conspicuous awns 23
- Spikelets without awns 25
- 23. Inflorescence fan-shaped and nodding, arise from sheaths 24
- Inflorescence not so.
 - Spikelets in groups of three, reddish, the central one awned, inflorescence branches in short whorls, stem rhizomatous, creeping and ridged by leaf-scars **Chrysopogon aciculatus** (7)
- 24. Annual grass up to 100 cm. high, tufted, leaves about 30 cm. long, inflorescence sheath bluish-green to dark red, hairy **Themeda arguens** (40)
- Perennial grass, more than 200 cm. tall forming large clumps, leaves about 100 cm. or more long, inflorescence sheath purplish, hairless **Themeda villosa** (41)
- 25. Spikelets arranged only along one side of the inflorescence branches 26
- Spikelets not all on one side 29
- 26. Creeping grass 27
- Tufted grass
 - Stem 30-60 cm high, blades hairless, margins often purplish, ligule absent, racemes distant, spikelets crowded in small groups 2-flowered **Echinochloa colunum** (15)
- 27. Creeping annual
 - Stem 15-40 cm. tall, leaf blade hairless, the lower empty glume as long as the spikelet with 5 green nerves, the upper flowering glume with a short stiff point at the tip **Brachiaria paspaloides** (4)
 - Creeping perennial 28
- 28. Stem up to 150 cm. high, blade densely hairy, nodes bearded, racemes several, spikelet stalk with

- 2 stiff long hairs, lower glume $\frac{1}{2}$ **Brachiaria mutica** (3)
 as long as the upper glume
 Stem about 30 cm. high, blade hairless except at base,
 spikelet stalk devoid of stiff long hairs, lower empty
 glume as long as the upper glume and is wrapped round the
 base of the spikelet **Brachiaria milliformis** (2)
29. Leaves with distinct crossveins 30
 Leaves without crossveins 31
30. Leaves with distinct petiole:
 Blade ovate lanceolate,
 broadest below the middle*, tapering to a sharp point,
 base narrowed, ligule obscure, spikelets with only 1
 bisexual floret and with several empty glumes above,
 each with short stiff awns forming a tuft at
 the top of the spikelet **Lophatherum gracile** (25)
 Leaves without distinct petiole.
 Blade elliptical, unequal sided, margins crisped,
 tinged purple, ligule a broad, irregular membrane,
 spikelets 3-4 flowered, flowering glumes edged with
 deflexed spiny hairs **Cenotheca lappacea** (5)
31. Grasses usually of aquatic or swampy habitat 32
 Grasses of other habitat 35
32. Spikelets flattened 33
 Spikelets not flattened 34
33. Spikelets fringed with a row of upcurved bristles on the keel.
 Coarse grass 60-120 cm. high, leaves rough, ligule
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 zig-zag branches, glumes absent **Leersia hexandra** (24)
34. Spikelets globose, pear shaped, stalks with glandular bands,
 leaves without distinct mid-rib **Isachne globosa** (20)
35. Spikelets flattened and break up from below upwards 36
 Spikelets not so 37
36. Perennial grass about 120 cm. high, inflorescence contracted,
 spikelets bluish-green, flowering glumes without hairs on
 the keels, leaf-blade 20-25 cm. long, leaf junction
 with sheath hairless **Eragrostis atrovirens** (17)
 Annual grass about 20 cm. high, inflorescence pyramid shaped

- with spreading branches, spikelets green tinged violet, flowering glume with slender stiff hairs on the keels, leaf-blade about 10 cm. long, junction of leaf with sheath hairy **Eragrostis tenella** (18)
37. Stamens 2 in each spikelet with 1 floret, inflorescence usually with many short branches 38
 Stamens 3 in each spikelet with 2 florets, inflorescence usually with long spreading branches further branched 39
38. Inflorescence dense, branches upright, not spreading, anthers white, leaf-junction with sheath not hairy **Sporobolus indicus** (39)
 Inflorescence with spreading branches, anthers purple, leaf-junction with sheath finely hairy **Sporobolus diander** (38)
39. Tufted grass forming large clumps, up to 300 cm. high, node hairy, leaves 15-100 cm. long, inflorescence 30-60 cm. long and 15-25 cm. wide, spikelets oblong, not hairy, upper empty glume 5-nerved, upper flowering glume transversely wrinkled **Panicum maximum** (28)
 Creeping or scrambling grass 40
40. Leaves rather short and broad, more or less oval, base cordate, margins wavy, spikelets elliptical and pointed, hairy, lower empty glume as long as the spikelet **Panicum brevisfolium** (27)
 Leaves long narrow and oblong 41
41. Stem with underground rhizome fleshy and stout.
 Inflorescence branches pointing obliquely upwards,
 Spikelets pale and hairless, lower empty glume short and small, upper empty glume broad and as long as the spikelet, 7-nerved **Panicum repens** (29)
 Stem without underground rhizome 42
42. Spikelets very asymmetrical and blunt 43
 Spikelets symmetrical and pointed 44
43. Inflorescence open with many very delicate spreading branches, spikelets hairy, ligule membranous **Cyrtococcum accrescens** (11)
 Inflorescence closed with upright short stiff branches, spikelets not hairy, ligule a folded irregular membranous ridge **Cyrtococcum oxyphyllum** (12)

44. Large scrambling grass, stem woody, leaves about 25 cm. long, thick and densely hairy on both sides, lower empty glume as long as the spikelet **Panicum sarmentosum** (30)
- Not so large and scrambling, stem not woody, leaves 5-15 cm. long, not hairy, margin of leaves parallel below a constriction at two-fifth the length from tip, lower empty glume $\frac{1}{2}$ the length of the spikelet, glumes ciliated **Ottochloa nodosa** (26)

KEY TO THE SPECIES OF SEDGES

Stem usually triangular and solid, leaves with closed sheaths
ligules and lodicules absent, fruit nut-like (achene if style
2-branched, utricle if style 3-branched) **CYPERACEAE**

1. Inflorescence unbranched and consists of a single spikelet
or one or more compact heads of spikelets at the end of stem 2
- Inflorescence much branched and consists mainly of radiating
branches of spikelets from end of stem or leaf-axils 6
2. Inflorescence of a single spikelet at the top of a wiry stem:
Flowering stem without leaf-blade, bracts absent,
glumes several with their mid-rib thickened at the tip
and produced into a short point **Fimbristylis acuminata** (52)
- Inflorescence of more than a single spikelet at the end of a
flattened or angled stem 3
3. Inflorescence of single compact head of spikelets 4
- Inflorescence with a cluster of heads of spikelets 5
4. Heads of spikelets almost white, leaves several ... **Cyperus kyllingia** (49)
- Heads of spikelets green, leaves 1 or 2 **C. aromaticus** (44)
5. Bracts only 1, continuing in line with the stem above the
spikelets, stem strongly 3-angled, base of stem with thin sheaths and
without leaf-blades, flower with 6 bristles **Scirpus mucronatus** (57)
- Bracts 2—3, subtending the spikelets, leaves present,
all arising from the base of stem which is flat above and
angled below, flowers without bristles **Lipocarpha argentea** (55)
6. Flowering stem without leaf blades, but with only leaf-sheaths 7
- Flowering stem with leaf-blades 8

7. Spikelets numerous and small,
 leafy shoots present **Fimbristylis miliacea** (54)
 Spikelets not very numerous, leafy shoots
 usually absent **F. globulosa** (53)
8. Leaf-blades winged.
 Leaves in groups of 3-8, the lowest leaf in the lowest
 1 or 2 groups with broad wings, spikelets all unisexual,
 nut hairy with raised ridges enclosing shallow depressions
 and seated on a reddish disc forming a cup $\frac{1}{2}$
 the length of the nut **Scleria sumatrensis** (58)
 Leaf-blades not winged 9
9. Flowers with bristles within the glume, nut topped by
 a persistent conical style base grooved down
 both sides **Rhyncospora corymbosa** (56)
 Flowers without bristles or conical style base 10
10. Spikelets all attached close together and radiating outwards,
 glumes with out-curved, pointed tips 11
 Spikelets arranged in rows along the axis of the spike, not attached
 close together, glumes without out-curved pointed tips 12
11. Stem tufted, very short up to 8 cm. tall, nut pitted ... **Cyperus radians** (50)
 Stem tuberous, variable up to 30 cm. tall,
 nut not pitted **C. compressus** (45)
12. Glumes closely overlapping 13
 Glumes not overlapping 14
13. Stem tuberous, up to 50 cm. tall, leaves shorter than the
 flowering stem, spikelets more than 1.2 cm. long, glumes blunt
 with a broad green keel and pale translucent margins
 turning reddish brown **C. rotundus** (51)
 Stem tufted, 90—120 cm. tall, leaves as long as stem,
 spikelets less than 1.2 cm. long glumes pointed, yellow with a
 green keel during golden brown **C. digitatus** (46)
14. Stem tufted, spikelets broader and shorter, rather close together
 and pointing upwards, nut yellow **C. iria** (48)
 Stem rising in close succession from a creeping rootstock,
 spikelets narrow spaced apart, glumes spreading outwards giving a
 zig-zag appearance, nut black **C. distans** (47)

WEED CONTROL METHODS

Recommended Herbicidal Mixtures, their Composition and Rates/acre

Mixture	Composition	Rate/acre
A	Ansar 529	5 pts.
	2,4-D amine	1 pt.
	Sodium chlorate	5 lbs.
B	Ansar 529	5 pts.
	2,4-D amine	1 pt.
	Dalapon (85%)	3 lbs.
C	Sordox HC	3 pts.
	2,4-D amine	1 pt.
	Sodium chlorate	5 lbs.
D	Ansar 18-15	4 pts.
	Sodium chlorate	5 lbs.
E	Ansar 529	5 pts.
	Sodium chlorate	5 lbs.
F	Sordox HC	3 pts.
	Sodium chlorate	5 lbs.
G	Sordox HC	3 pts.
	2,4-D amine	1 pt.
H	Ansar 529	6 pts.
	2,4-D amine	1 pt.

Weed Control Index, Rating and Degree of Control

Index	Rating	Degree of Control
1.	No Effect	Nil
2.	Slight check	20% kill
3.	Moderate check	21 — 30% kill
4.	Fair check	31 — 40% kill
5.	Satisfactory check	41 — 50% kill
6.	Good check	51 — 60% kill
7.	Effective check	61 — 70% kill
8.	Effective check	71 — 80% kill
9.	Effective check	81 — 90% kill
10.	Complete kill	91 — 100% kill

The degree of Control of Specific Weeds achieved by the various herbicide mixtures under different crops are given in Table 1.

TABLE 1. Recommended Herbicidal Mixtures for Weed control in Oil Palm, Rubber, Sugar Cane, Orchards and Cocoa and Tea and the degree of Control of Weed Species.

MONOCOTYLEDONOUS WEEDS	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 year & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut			For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
1. <i>Axonopus compressus</i>	10	10	10	10	10	10	10	10
2. <i>Brachiaria milliformis</i>	7	9	7	6	7	7	7	7
3. <i>Brachiaria mutica</i>	7	9	7	6	6	6	7	6
4. <i>Brachiaria paspaloides</i>	6	9	7	6	6	6	6	5
5. <i>Cenotheca lappacea</i>	10	10	10	10	10	10	10	10
6. <i>Chloris inflata</i>	8	8	8	8	8	8	8	7
7. <i>Chrysopogon aciculatus</i>	8	8	8	8	8	8	8	7
8. <i>Coelorachis glandulosa</i>	6	6	8	6	6	7	7	6
9. <i>Coix lachryma-jobi</i>	6	7	8	6	6	6	8	6
10. <i>Cynodon dactylon</i>	3	8	3	2	3	3	3	3
11. <i>Cyrtococcum accrescens</i>	10	10	10	9	9	9	10	10
12. <i>Cyrtococcum oxyphyllum</i>	10	10	10	9	9	9	10	10
13. <i>Dactyloctenium aegyptium</i>	8	8	9	6	8	9	8	8
14. <i>Digitaria adscendens</i>	10	10	9	9	9	9	9	9
15. <i>Echinochloa colonum</i>	6	8	9	6	5	7	8	6

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut			For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
16. <i>Eleusine indica</i>	6	8	9	5	5	8	7	5
17. <i>Eragrostis atrovirens</i>	6	8	8	6	6	8	8	6
18. <i>Eragrostis tenella</i>	6	8	9	6	6	8	8	6
19. <i>Imperata cylindrica</i>	2	5	2	2	2	2	2	2
20. <i>Isachne globosa</i>	4	8	5	3	4	4	5	4
21. <i>Ischaemum indicum</i>	8	9	9	8	8	9	9	8
22. <i>Ischaemum timorense</i>	8	9	9	8	8	9	9	8
23. <i>Ischaemum muticum</i>	10	10	10	10	9	9	9	9
24. <i>Leersia hexandra</i>	3	9	5	3	3	3	5	5
25. <i>Lophatherum gracile</i>	8	9	9	8	8	9	8	8
26. <i>Ottochloa nodosa</i>	6	8	6	5	5	5	6	6
27. <i>Panicum brevifolium</i>	10	10	10	9	9	9	9	9
28. <i>Panicum maximum</i>	7	9	8	6	6	6	7	7
29. <i>Panicum repens</i>	3	7	3	2	2	2	2	2
30. <i>Panicum sarmentosum</i>	7	9	6	4	6	6	8	6

TABLE 1. Recommended mixtures for weed control in Oil Palm 'Kapriel' 2000. Cane

MONOCOTYLEDONOUS
WEEDS

DEGREE OF WEED CONTROL

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut			For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
31. <i>Paspalum commersonii</i>	6	8	8	9	6	8	7	6
32. <i>Paspalum conjugatum</i>	10	10	10	10	10	10	10	10
33. <i>Pennisetum purpureum</i>	6	6	6	5	6	6	6	5
34. <i>Phragmites karka</i>	6	6	6	5	6	6	6	6
35. <i>Rhyncheletrum repens</i>	9	9	9	9	9	9	9	8
36. <i>Sacciolepis indica</i>	9	9	9	9	9	9	8	9
37. <i>Setaria palmifolia</i>	7	6	8	5	6	8	8	6
38. <i>Sporobolus diander</i>	6	8	8	5	5	8	7	6
39. <i>Sporobolus indicus</i>	7	8	8	6	5	6	6	5
40. <i>Themeda arguens</i>	6	7	6	6	5	6	6	5
41. <i>Themeda villosa</i>	4	6	6	4	4	5	5	5
42. <i>Tripsacum laxum</i>	8	8	8	7	6	6	8	8
43. <i>Zoysia matrella</i>	3	9	3	3	3	3	3	2

DEGREE OF WEED CONTROL

MONOCOTYLEDONOUS WEEDS

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut		For Sugar Cane (After Diuron Application)		
	A	B	C	D	E	F	G	H
SEDGES								
44. <i>Cyperus aromaticus</i>	8	8	8	8	8	8	9	9
45. <i>Cyperus compressus</i>	9	9	9	8	8	8	9	9
46. <i>Cyperus digitatus</i>	9	9	9	8	8	8	9	9
47. <i>Cyperus distans</i>	9	9	9	8	8	8	9	9
48. <i>Cyperus iria</i>	9	9	9	8	8	8	9	9
49. <i>Cyperus kyllingia</i>	9	9	9	9	8	8	9	9
50. <i>Cyperus radians</i>	9	9	9	8	8	8	9	9
51. <i>Cyperus rotundus</i>	6	6	6	5	5	5	7	7
52. <i>Fimbristylis acuminata</i>	8	8	8	6	8	8	9	8
53. <i>Fimbristylis globulosa</i>	8	8	8	6	8	8	9	8
54. <i>Fimbristylis miliacea</i>	8	8	8	6	8	8	8	8
55. <i>Lipocarpa argentea</i>	8	8	8	6	8	8	8	8
56. <i>Rhynchospora corymbosa</i>	9	8	8	7	8	7	8	9
57. <i>Scirpus mucronatus</i>	9	9	8	7	7	7	8	9
58. <i>Scleria sumatrensis</i>	9	9	8	7	7	7	8	9

DEGREE OF WEED CONTROL

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut			For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
MONOCOTYLEDONOUS WEEDS								
BROADLEAVES								
59. <i>Alocasia macrorrhiza</i>	5	5	5	5	3	3	5	5
60. <i>Commelina nudiflora</i>	6	6	6	5	4	4	6	6
61. <i>Costus speciosus</i>	6	6	8	6	4	4	8	6
62. <i>Curculigo villosa</i>	8	8	8	6	6	6	8	8
63. <i>Dianella nemerosa</i>	8	8	8	6	6	6	8	7
64. <i>Eichhornia speciosa</i>	8	8	8	7	4	4	8	8
65. <i>Globba pendula</i>	5	6	6	6	4	4	6	4
66. <i>Lasia aculeata</i>	5	6	6	4	3	4	6	4
67. <i>Monochooria vaginalis</i>	9	8	8	6	3	4	8	4
68. <i>Typha angustata</i>	8	8	8	6	6	5	8	8
DICOTYLEDONOUS BROAD-LEAF WEEDS								
69. <i>Ageratum conyzoides</i>	10	10	10	10	8	8	10	10
70. <i>Amaranthus spinosus</i>	8	8	8	6	5	5	8	9
71. <i>Asystasia coromandeliana</i>	10	10	10	10	6	6	10	10

DEGREE OF WEED CONTROL

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut		For Sugar Cane (After Diuron Application)		
	A	B	C	D	E	F	G	H
DICOTYLEDENOUS WEEDS								
72. <i>Borreria laevicaulis</i>	8	8	8	6	5	6	8	8
73. <i>Borreria latifolia</i>	8	8	9	6	5	6	8	8
74. <i>Cardiospermum halicacabum</i>	10	10	10	8	6	6	9	9
75. <i>Cassia tora</i>	5	5	5	5	3	4	5	5
76. <i>Cleome rutidosperma</i>	10	10	10	10	7	7	10	10
77. <i>Clidemia hirta</i>	9	9	9	9	7	7	8	8
78. <i>Cordia cylindristachya</i>	6	6	6	6	5	5	6	6
79. <i>Croton hirtus</i>	6	6	8	6	3	4	7	6
80. <i>Elephantopus scaber</i>	9	9	9	8	5	6	9	8
81. <i>Erechtithites valerianifolia</i>	9	9	9	9	5	6	9	9
82. <i>Eupatorium odoratum</i>	6	6	6	6	4	4	6	6
83. <i>Euphorbia hirta</i>	8	8	8	7	5	5	7	8
84. <i>Fagraeae recemosa</i>	6	6	6	6	3	4	6	6

	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)				For Orchards, Young Oil Palm & Young Coconut		For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
85. <i>Hydrocotyle asiatica</i>	6	6	7	6	5	6	6	3
86. <i>Hyptis brevipes</i>	10	10	10	9	9	9	5	5
87. <i>Ipomoea cairica</i>	7	7	6	6	4	4	6	3
88. <i>Jussiaea suffruticosa</i>	9	9	9	9	6	6	8	8
89. <i>Lantana camara</i>	6	6	6	7	5	4	6	6
90. <i>Melastoma malabathricum</i>	6	6	6	7	4	4	6	5
91. <i>Melothria affinis</i>	5	5	7	5	4	4	6	5
92. <i>Merremia umbelata</i>	8	7	9	7	5	6	8	7
93. <i>Mikania cordata</i>	9	9	9	7	5	5	9	9
94. <i>Mimosa pudica</i>	6	6	7	6	5	5	7	6
95. <i>Oldenlandia dichotoma</i>	6	6	6	6	4	4	6	6
96. <i>Paederia foetida</i>	5	4	5	6	3	4	4	4
97. <i>Passiflora foetida</i>	8	7	7	8	4	5	6	6
98. <i>Physallis minima</i>	8	8	9	7	5	7	9	8
99. <i>Phyllanthus niruri</i>	8	8	8	8	5	5	6	8

DICOTYLEDONOUS WEEDS	DEGREE OF WEED CONTROL							
	A	B	C	D	E	F	G	H
	For Rubber (mature & immature), Oil Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut		For Sugar Cane (After Diuron Application)		
100. <i>Polygonum chinense</i>	8	8	8	8	5	6	7	8
101. <i>Rubus moluccanus</i>	6	6	6	6	4	4	5	6
102. <i>Scoparia dulcis</i>	8	8	8	7	6	6	8	8
103. <i>Sida acuta</i>	8	6	8	7	6	6	6	8
104. <i>Solanum torvum</i>	6	6	6	6	5	6	6	6
105. <i>Sparganophorus vaillantii</i>	6	6	6	6	4	5	6	6
106. <i>Stachytarpheta indica</i>	6	6	7	6	4	5	6	6
107. <i>Tetracera indica</i>	6	6	6	6	4	4	6	6
108. <i>Tetracera scandens</i>	6	6	6	6	4	4	6	6
109. <i>Trichosanthes wallichiana</i>	8	8	8	8	5	5	7	7
110. <i>Tridax procumbens</i>	7	7	8	6	6	6	7	7
111. <i>Triumfetta rhomboidea</i>	5	5	5	5	4	4	7	5
112. <i>Urena lobata</i>	7	6	7	7	4	4	7	7
113. <i>Vitis japonica</i>	8	7	9	7	6	6	8	7
114. <i>Youngia japonica</i>	9	9	9	9	6	6	9	8

FERNS	DEGREE OF WEED CONTROL							
	For Rubber (mature & immature), O I Palm (10 years & above), Cocoa (mature) and Tea (mature)			For Orchards, Young Oil Palm & Young Coconut			For Sugar Cane (After Diuron Application)	
	A	B	C	D	E	F	G	H
115. <i>Dicranopteris linearis</i>	9	8	9	8	8	8	8	8
116. <i>Lygodium flexuosum</i>	9	8	9	8	8	8	8	8
117. <i>Nephrolepis bisserata</i>	9	9	9	9	8	8	8	8
118. <i>Phymatodes scolopendria</i>	8	8	8	8	8	8	8	8
119. <i>Stenochlaena palustris</i>	8	8	8	8	8	8	8	8
120. <i>Taenites blechnoides</i>	8	8	8	8	8	8	8	8

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